

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Flagstaff	15s. .. 17s. 6d.	South Condurrow	9 .. 9½
Frontino	2 .. 2½	Tankerville	3 .. 4
Glenroy	16s. .. 18s.	Tincoff	11 .. 12
Gorse and Merilyn	3½ .. 5	Van	27 .. 30
Grogwinion	23½ .. 24	West Chiverton	13 .. 14
Great Laxey	20 .. 21	West Pateley Bridge ..	1 .. 1½
Herodfoot	9 .. 10	West Godolphin	1 .. 1½
Hingston	10s. .. 12s.	West Tankerville	15s. .. 20s.
Last Chance	10s. .. 15s.	West Wye Valley	3½ .. 4
Ladywell	17s. 6d. .. 20s.	W. Grenville	2½ .. 3
Leadhills	3½ .. 4½	Wheal Kitty	1½ .. 2½
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25 Birdseye Creek, 16s. 6d.	10 Hultafall, 24 15s.	15 Richmond, 23 5s.
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50 Chontales, 12s. 6d.	40 Hingston, 9s.	25 Russian Copper, £1 7 6
50 Cambrian, 23 10s.	25 Last Chance, 17s. 6d.	50 S. Roman Grav., fully paid, 3s.
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50 Condes of Chili, 15s.	20 Leadhills, 24 2s. 6d.	60 Tecoma, 5s.
25 Chicago, 21 15s.	15 N. Quebrada, £2 2s. 6d	50 Tyn-y-fon
100 Don Pedro, 10s. 9d.	75 Nth. Laxey, 6s. 6d.	3 Van, 28 5s.
25 Devon Cons., 23 8s. 9d.	30 New Zealand Kap.	25 West Pateley Bridge,
15 East Van, 22 7s. 6d.	£1 1s. 6d.	£2 2s. 6d.
20 Eberhardt, 26 15s.	25 Marke Valley, 12s. 9d.	20 W. Tankerville, 14s.
40 East Caradon, 14s.	5 Minera, 21s.	75 Yorke Penin., 5s. 6d.
200 Exchequer, 4s.	50 Pestarena, 6s. 6d.	
25 Frontino, 22 2s. 6d.	20 Pateley Bridge, 23.	

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Certificated Mining Engineer.

(Formerly Student at the Royal Bergakademie, Clausthal).

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SECTION III.

The publication of these Lectures is unavoidably suspended for two or three weeks. They will then be resumed and continued regularly.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergsrath Dr. VON GRODDECK, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

ON THE RESOURCES AND FUTURE DEVELOPMENT OF THE COAL FIELDS OF EUROPE.*

The extent and development of our coal fields must always be a subject of the greatest interest to Englishmen, as our country owes much of its manufacturing supremacy to the abundance and cheapness of the supply of fuel. Should this supply be materially diminished or should other countries, by rapid development of their mineral wealth, outstrip us in the cheapness of their fuel, our manufacturing supremacy will be endangered. Hence, it is important for us to be acquainted with the extent and situation of the coal fields of other countries, and to watch carefully the development of mining enterprise all over the world.

Europe, compared with America and Asia, is but scantily supplied with fuel; in Asia, India alone has a greater area of coal fields than all Europe, while China has still greater stores of fuel. Upwards of 200,000 square miles, or 1-10th of the whole area of the United States of America, consists of coal measures, while in Great Britain the area of the coal fields is only 1-15th of the whole, or some 7000 square miles, and yet it probably exceeds that of all the other countries of Europe put together, Russia alone excepted.

The present production of coal in the world is approximately as follows:—

Great Britain, 1876	...	Tons	133,344,766
United States, 1874	...	...	44,091,922
Prussia, 1876	...	...	42,819,345
Belgium, 1876	...	...	14,786,160
France, 1867	...	...	12,148,233
Austria, 1862	...	...	4,552,500
Australia and New Zealand	...	...	3,000,000
British North America	...	...	1,500,000
Mexico	...	...	1,000,000
Chili	...	...	1,000,000
Italy, 1862	...	...	775,000
British India, 1868	...	...	564,933
Spain, 1862	...	...	388,950
Russia and Poland	...	...	262,500

GREAT BRITAIN.

From the preceding table it will be seen that our country occupies by far the highest position in point of production, our output being about equal to that of all other countries together. There is, however, no doubt that we have developed our resources much more thoroughly than other countries, and that though our coal fields could maintain their present output for 1040 years yet some of our coal deposits will be worked out long before that time. To this approaching exhaustion I would now direct your attention, as it has a most important bearing on the prosperity of the districts affected, and the general welfare of the country. Even in the next century it will tell against the industries of Scotland and the North of England.

To begin with, take the Scotch coal field, of which the production in—

1876 was 18,665,552 tons

and in 1868 was 14,709,959 "

being an increase in eight years of 3,955,593 tons per annum.

The production is likely to be still further increased as the coal is easily and inexpensively worked; deep pits are unknown in Scotland, and the demand for manufacturing and domestic purposes must increase with the rapid growth of the population and extension of manufactures.

We naturally ask what is the supply? The Royal Commission in their 1871 report, give 9,843,000,000 tons as the quantity of available coal in Scotland. Now, after deducting what has been extracted since that date, we find the present output can only be maintained 500 years. Probably in a century and a-half a great diminution in the output will be apparent, which will exercise a very prejudicial effect on the prosperity of the South of Scotland.

We next come to the coal field of Northumberland and Durham, unequalled for the quality of its coke and the natural facilities which its rivers afford for the export of coal. Its annual production, 32,000,000 tons, almost equals that of the United States or Prussia, while it surpasses that of all other countries put together. In the last eight years its increase has been rapid, upwards of 1,000,000 tons per annum.

Output in 1876	...	Tons	31,991,623
" 1868	...	...	24,394,167

Increase 7,597,456

The quantity now available is probably about the same as in Scotland, and at the present rate of production will last only some 300 years. In consequence of the great depression in the iron trade the production last year was a little less than in the previous one, though there is every probability that the output will be well maintained for many years. In 50 years this district will not be able to retain its present proud position of largest producer among the coal fields of Great Britain, and in two centuries coals may regularly be sent from Yorkshire to the ironworks in Durham. The waters of the Tyne and the Wear will then no longer be darkened by fleets of colliers waiting to convey the black diamond of the North to all parts of the world, for the export trade will be gone.

The South Staffordshire coal field is already half worked out; but, lying in close proximity to other more extensive coal fields, its ironworks and manufactories can be supplied on reasonable terms; and, though its day of cheap coals is over, its industry is not threatened with a short supply of fuel for many years to come.

The coal fields of Lancashire and Cheshire can probably maintain the output for 800 years, as, besides the visible, there is a large concealed supply. Looking, however, at the vast and increasing industry of the district, we cannot boast of any too large a supply of coal.

Having considered our best-developed coal fields, let us now examine where the greatest future extension of mining enterprise is to be looked for. The first is the South Wales basin, containing probably 32,000,000,000 tons, or one-fourth of the whole available supply of coal in Great Britain, its output being at present one-ninth. Abutting on the sea-coast, and with convenient ports of shipment, South Wales will at no very distant time take the lead in the export trade

which the Northumberland and Durham district does at present, and the era of cheap fuel will probably last longer there than in any other part of Great Britain.

Equally bright is the future of the great coal field of Yorkshire, Derbyshire, and Nottinghamshire, with an available supply of 41,000,000,000 tons, or nearly one-third of the whole supply of the United Kingdom. This abundance of excellent fuel must rapidly increase the manufacturing industry and prosperity of the district.

Amongst the smaller coal fields those of the North Staffordshire district and Bristol probably admit of great development.

GERMANY.

The production of coal has increased more rapidly in Germany than in almost any other country, and it now nearly equals that of the United States. To the west the largest coal field is the basin of the Saar, with an area of some 900 square miles. As yet, however, the output is but small.

In point of production by far the most important are the great coal fields of the Rhine, Ruhr, and Westphalia, yielding together about one-half the whole produce of Germany.

In 1876 it was ... 17,902,412 metric tons coal.

And 100,124 metric tons brown coal.

Total 18,002,536

This coal is of very superior quality; it can generally be more cheaply mined than either Belgium or French coal, and but for its distance from the sea would be a serious competitor of ours in the foreign trade. Several collieries on the Ruhr are already sending quantities to the London market, and efforts are being made to establish shipping ports on the North Sea.

At Piesburg, near Osnabrück, to the north of the last-named coal field, a fair quality of anthracite coal is found. It is but little worked or appreciated at present. There seems, however, to be a great future for it in the supply of the numerous steamers at Hamburg and Bremerhaven, to which it is the nearest coal field.

The coal fields in Silesia are the next in importance; they have a large area, and had an output—

In 1876 of 10,618,379 metric tons coal.

And 440,488 metric tons brown coal.

Total 11,508,867

Then follow the coal fields of Hanover, Hesse Nassau, and Saxony—the total production of Prussia for the year 1876 being 34,466,249 metric tons coal, and 9,985,122 metric tons brown coal. Some three-fourths of the brown coal is the produce of Magdeburg and Merseburg, in Saxony. About 1,000,000 tons are, however, raised in Brandenburg.

(To be concluded in next week's Journal.)

GOLD MINING IN BRITISH COLUMBIA.

Active efforts are now being made to develop the recently discovered Bonanza and Steadman ledges in the Cariboo mining district of British Columbia, more than 20 companies being in operation there. For the working of the Bonanza ledge the Enterprise Company, which have a location upon it, have already driven their tunnel 275 ft., and will ultimately cut the ledge 150 ft. from surface. The elevation of the ledge at this point is 1200 ft. above the bed of Lowhee Creek, and the width of the ledge at surface is from 18 ft. to 20 ft. To the south-east of the Enterprise claim (it should have been stated that both the Bonanza and the Steadman ledges run almost exactly north-west and south-east) and beyond the Lone Star claim is the Victoria Gravel Mining Company's shaft, where at a depth of 130 ft. the ledge was struck in a drift, and found to be 30 ft. wide, the assays averaging \$36 per ton. Next comes the American Company's ground, and then that of the Cariboo Quartz Mining Company, where they have cut the ledge 52 ft. below the surface, the vein at this point being 22 ft. wide, giving assays ranging from \$14 to \$155 per ton, and averaging \$33. The other companies working on the Bonanza ledge are, commencing on the north-west, the British Columbia, the Ring, Sadow's Crown Grant, the Australian, Dunlevy, and Pinkerton. Then comes the two claims of the Enterprise already mentioned, the Lone Star, the Victoria, and the Cariboo, which have also been referred to, the St. Lawrence, the Wintrip Company's Crown Grant, and the Black Jack Company's Crown Grant being the most south-easterly located. On the Steadman ledge there is the McKenzie exactly south-west and parallel with the Wintrip Crown Grant, and following the ledge in a south-easterly direction we reach the locations of the British Columbia and the Walker, where the croppings assayed \$20 to \$30 per ton, and worked \$13½ all round, the ledge being 5 ft. wide. Then comes the Cariboo Company's claim and the Consolidated Virginia.

The work of development has commenced in earnest, and indications all point to the opening of a large and productive quartz mining region. The present Government of the province is active in promoting the development of the country, and a few months since engaged Mr. R. B. Harper, an old and experienced quartz miner, to visit the Cariboo region, and give the quartz prospects a careful examination. Mr. Harper, after a careful investigation, satisfied himself of the existence of paying quartz, and under his directions tunnels were run which demonstrated beyond a doubt the correctness of his theories. The principal claims are located upon the Big Bonanza ledge, situated on the summit of the mountain back of Barkerville. The ledge is a true fissure vein with well-defined walls and has been traced for a distance of five miles. The Cariboo Quartz Mining Company's tunnel has cut the ledge at a distance of 52 feet from the surface. At this point the vein is 22 feet in width, with assays ranging from \$14 to \$155 to the ton. The average assays across the vein show \$33 per ton. The ore is a soft quartz, carrying free gold and sulphurets, with a slight trace of silver. A four-stamp mill, with imperfect appliances, has been busily engaged in running upon rock from this claim for most of the time since Oct. 8, 1877, with the most satisfactory result. The gross yield for two months to Dec. 1 may be put down at \$5000. The company has decided to erect a first-class 20-stamp mill at once, and Mr. Harper is now having the plans and specifications prepared in this city.

Adjoining the Cariboo claim on the south-east is the St. Lawrence location of 1500 ft. In this claim a cut has been run across the vein showing the same character of ore found in the Cariboo. It is proposed to open the St. Lawrence by a tunnel 350 ft. in length, which will cut the vein at a depth of 100 ft. from the surface. The American Company's claim adjoins the Cariboo on the north-west. An open cut has been run across the vein, showing the same kind of ore disclosed in the Cariboo and St. Lawrence. A tunnel is projected by this company which will cut the vein 150 ft. from the top. The Pinkerton lies next to the American. The ledge in this location has been cut through by Lowhee Creek in the Victoria shaft at a depth of 350 ft. from the croppings of the Cariboo location. Where exposed by the Victoria shaft it is 30 ft. wide, averaging \$36 per ton in gold, with traces of silver.

The British Columbia Mill and Mining Company have decided to order a 20-stamp mill. The Enterprise Mine lies next to the north of the Pinkerton, is being energetically developed, and a mill will be erected. There is probably no doubt that the Big Bonanza ledge is the feeder of the famous Williams and Lowhee Creeks, and the mother lode of the country. The yield from these creeks since 1862 amounts to the astounding sum of \$40,000,000. All placer gold is made up of particles and detached fragments which once formed a part of some vein, and from which they have been detached by

various mechanical causes, especially by the action of currents of water. The creeks below the ledge were astonishingly rich, and it is a fair inference that this ledge was the source of the placers. The conditions for successful quartz mining in the district Mr. Harper represents to be extremely favourable. Wood is \$4 per cord, and water power is abundant; labour is plentiful. The winters in Cariboo are severe, but no more than in many elevated localities in California and Colorado where mining is carried on all the year through. The location of the Big Bonanza ledge is such as to admit of its being worked by tunnels, thus enabling the miner to deliver his ore at the mills without exposure to the weather. The Canadian trans-continental railway may now be considered a fixed fact. The road will traverse this region. Exhaustive surveys have been made, and a portion of the road, Pembina, already constructed. Barkerville is connected with San Francisco by wire, and communication with the mines can easily be had at all times. Mr. Harper represents that there is great rejoicing among our neighbours over the new developments. Property has advanced in Victoria and elsewhere in the province, and British Columbia seems to have entered upon a new career of prosperity.

[Mr. R. B. Harper, the Government Mining Engineer of British Columbia, referred to above, is a native of Redruth, Cornwall. On leaving England in 1863 he went to Bolivia, where he was engaged in copper and silver mining. In 1864 he removed to California, and has since then occupied various important positions in the management of gold and silver mines in California, Nevada, and Mexico, until his appointment about nine months ago to the above position in British Columbia, where he has made the important discoveries of which the above is a description.]

TECHNICAL EDUCATION IN NEW BRUNSWICK.

The efforts made in the various Canadian provinces to place sound technical and scientific instruction within the reach of those who design in after life to devote themselves to the development of the commercial and industrial resources with which the provinces are so highly favoured have frequently been noticed in the *Mining Journal*; and the new Calendar of the University of New Brunswick shows that the authorities at Fredericton have not only made the institution attractive to a larger number of students, but that during the past year a large amount of very satisfactory work has been got through. Comparing the number of passes with the number of candidates, it is evident that ample care is taken to maintain the standard to be reached to give a title to the honour of being a graduate of the University; yet the facilities offered for obtaining the necessary instruction are certainly not surpassed by any educational institution in existence. The University being under the direct control of the Government—his honour the Lieut.-Governor of the Province, the Hon. S. L. Tilley, C.B., filling the office of Visitor on behalf of Her Majesty—every endeavour is made to make it available to all who are worthy of the honours offered; and hence it is that the President—Dr. W. Brydson Jack—has been furnished with an ample staff of professors for the carrying on of the business of the institution.

There is no theological faculty, but every student is required to attend regularly such places of public worship as those having control of him may direct; and with regard to the general curriculum the mention that there are chairs of mathematics, natural philosophy, and astronomy, chemistry and natural science, classical history and history, and French language and literature, will suffice to show that the general education of the student is well cared for; but perhaps the most important features of the establishment, regarding it from a practical point of view, are, first, that a large proportion of the students can get through their undergraduate course (including 40 weeks board, lodging, fuel, light, washing, tuition fees, text-books, library and plate fees, and gymnasium) for 16l. 10s. sterling per annum, whilst those who are not fortunate or intelligent enough to obtain one of the public scholarships, of which many are open for competition each year, can still pass through for the very insignificant sum of 35l. sterling per annum; and, secondly, that so much attention is given to practical engineering, surveying and levelling, navigation and nautical astronomy, and the natural sciences that whatever place in commerce or industry the graduates may afterwards be called upon to occupy they will be able to acquire themselves with credit to themselves and to their university, so that it may fairly be hoped that the onward progress of the institution may long continue.

THE MINING CUSTOMS OF DEVON AND CORNWALL.

At what precise time and in what precise manner the first law of England first recognised and legalised the usages of Cornwall and Devon* can only be vaguely gathered from the history of the successive relations in which the two counties appear to have stood towards the reigning sovereign for the time being. William the Conqueror appears to have retained the greater part of the county of Cornwall in his own hands, and afterwards to have granted them to his half-brother Robert with the title of Earl of Cornwall. These lands reverted to King John, who in 1215 claimed all the minerals within the earldom lands as portion of the royal demesnes, but at the same time he recognised, and, therefore, impliedly legalised, the customary mining rights of the people of the county, whatever these rights may have been. It further appears that the earldom lands were again the property and possession of the Crown in the reign of Edward I., who in the 33rd year of his reign granted corresponding but distinct charters of liberties to the tinners of Cornwall and Devon, giving the right to mine according to the customs, subject always to a right of pre-emption and other rights in the Crown. About 1353 King Edward III. erected the earldom into a duchy, and also (though this is doubted) issued in 1359 a commission to enquire into the mining customs of Cornwall, and also (apparently as the result of the enquiry) granted to all the possessors of land within the duchy full liberty to dig for all mines whatsoever, paying one-third of the silver and one-half of the gold to the Crown, and enacted that in case the landowners failed to exercise the liberty the King might dig all these mines himself by his own servants. It is probable that the commission was issued in consequence of complaints of private landowners, that the tinners' exercise of their rights was seriously injurious to the owners' lands. And it is clear that the charter of Edward III., although recognising a prior right in the landowner, reasserted the right of the Crown as the representative and grantor of the popular liberties to dig by its own servants—that is to say, by the tinners.

The Statutory Parliament of Cornwall is summoned and presided over by the Lord Warden or Vice Warden, and consists of 24 representatives returned in equal numbers from the Stannaries of Frognore, of Blackmore, of Teyrnaballe, and of Penwith and Kerrier. Sixteen of these stannaries form a binding majority; they are returned by the mayors of the four stannary towns, and they select during their sittings as many assistants from those practically concerned in tinworks as they think proper, who form a lower house of assembly. The two assemblies have declared and ascertained at various times the customs which ought to be observed in the county, the most notable occasions of their doing so having been (prior to the last 100 years) in the 22 of James I.; in the 11 and 12 of Charles I.; 2 of James II.; 2 of Anne; and in the 28 of George II. Under the customs as thus from time to time ascertained the right of working tin mines was conferred upon all free tinners upon the tender of a certain portion of the minerals raised to the owner or lord of the soil. This proportion was called the toll tin, and was usually one-fifth of the produce, although by particular custom it might be one tenth. A tin bound was usually about an acre in extent, and tin bounds are personal property. The owner of a bound often demises it to others subject to the payment of farm tin or tin dues; but the bound still continues liable to the tender of toll tin to the owner of the soil, and the bounder himself is responsible for its being rendered. If the partner in a tin mine shall not within a month after notice demise his portion or contribute labour or money according to his share, he may be precluded afterwards from taking any active part in the adventure, and must abide by the management of a majority of the other partners, and be entitled to his proportion of the farm only. In case of contribution of labour by some, and money by others, the farm is to be assessed by three indifferent tinners, one chosen by the working partners, another by those not working, and the third by the steward of the Court. Any partner is permitted to contribute his proportion of any mining materials which are required instead of a money payment, and the value of such materials is to be fixed by a majority at the time the accounts are passed. Every tinner defrauding his partner to the extent of 1s. is liable to a penalty not exceeding 50l. Tinners are free from all taxes and tolls in selling their goods at fairs and markets.

The customs of the Stannaries of Devon have been also partially ascertained by the local parliaments of that county. These parliaments are composed of jurors returned by each of the Stannary Courts of Chaggeford, Ashburton, Plympton, and Tavistock. Each of these Courts returns 24 jurors, whose united acts bind the rest of the county. The customs are very similar to those of Cornwall. The leading points of difference seem to be that the tin bounds of Devon do not constitute personal but real estate, subject to all the usual incidents. The custom of tin bounding, which has in recent times fallen into some disuse, has recently been much discussed. It appears that the bounds are not preserved unless actually worked. It had been usual for the bound owners on ceasing to work annually to renew the bounds by turning up a turf at the four corners, and bounds in this state have long been subjects of sale, settlements, and devises. Although several

* "A Treatise on the Law of Mines and Minerals." By William Bainbridge. Fourth Edition. By ARCHIBALD BROWN, M.A., B.O.L. London: Butterworths, Fleet-street.—[Concluding notice.]

* Paper read by Mr. W. H. JOHNSON, B.Sc., at the Manchester Geological Society.

mines are worked as tin bounds, there are very rare instances of acquiring new bounds according to the custom.

It need scarcely be stated that Mr. Brown quotes an abundance of cases in support of the opinions he expresses, whilst from the careful and systematic way in which the whole book is arranged it would be difficult to imagine any question connected with practical mining law which could be presented to the professional reader that would necessitate more than five minutes' reference to the volume for its satisfactory elucidation.

THE RADSTOCK COLLIERY PROPRIETORS. (BRAHAM V. BEACHIM.)

In the High Court of Justice—Chancery Division.

Between CHARLES BAMPFIELD BRAHAM, WARD SOANE BRAHAM (since deceased), and the Right Honourable FRANCES ELIZABETH ANNE DOWAGER COUNTESS WALDEGRAVE, the wife of the Defendant the Right Honourable Chichester Samuel Baron Carlingford, by the said Charles Bampffield Braham, her next friend, and WILLIAM BEACHIM (otherwise William Beachim-Beauchamp), and THORPUS GULLICK, and the Right Honourable Chichester Samuel Baron Carlingford, Defendants.

Counsel for the Plaintiffs—Mr. Fischer (Q.C.), Mr. Chas. Browne, Mr. Geo. Francis (Com. Law Bar.), and Mr. B. Fossett Lock.

For Lord Carlingford—Mr. Walter Ball.

For the Defendants—William Beachim (otherwise William Beachim-Beauchamp) and Thorpus Gullick—Mr. Wm. H. G. Bagshawe (Q.C.), and Mr. Edwd. Cutler.

Before Mr. JUSTICE FRY—Tuesday, 12th February, 1878.

Mr. JUSTICE FRY: I am prepared, Mr. Fischer, to grant you an injunction in these terms, restraining the defendants their servants and agents, unless and until the defendants shall acquire a colliery or coal mine in the parish of Radstock, in the county of Somerset, from trading under or using the name or style of proprietors, or any other name or style signifying or implying that the defendants are the proprietors of any collieries at Radstock, or that they are authorised to sell or supply coals raised from or gotten from any coal mines at Radstock. If you ask for any further injunction you must address me upon that.

Mr. FISCHER: I do not, my lord, intend to ask for more than that, as I understand the injunction will be "unless and until."

Mr. JUSTICE FRY: Yes, "unless and until the defendants shall acquire a colliery or coal mine within the parish of Radstock, in the county of Somerset." It will not be necessary for me to hear you if you do not ask for anything further than that.

Mr. FISCHER: No, my lord.

JUDGMENT.

Mr. JUSTICE FRY: In this case the Dowager-Countess Waldegrave and her trustees are the plaintiffs, and substantially the defendants are two gentlemen named Beachim and Gullick, who carry on business as coal merchants and coal dealers. The plaintiffs ask for an injunction in the terms I have already stated, and a further injunction restraining the defendants from using any name or style which is a colourable imitation of the name or style of The Radstock Collieries, or otherwise infringing the trade mark or name or style of the Radstock Collieries used or adopted by the plaintiffs in respect of the business of their collieries and coal mines at Radstock aforesaid. Now, it appears that in the northern part of the county of Somerset there is a parish named Radstock, that in that parish are situated five coal pits known as the Old Pit, Middle Pit, the Ludlow Pit, the Tynning Pit, and the Wellaway Pit. They are the five pits which are the property of the plaintiffs, and are worked by the plaintiffs, or rather by the plaintiff Countess, who is absolutely entitled to the proceeds of the estate for her separate use. It appears that the first three—the Old Pit, the Middle Pit, and the Ludlow Pit—were worked down to about the year 1845 by a company who called themselves the Radstock Coal Company, and in popular language it was called the Old Radstock Company. That company did not adopt the names of the three pits. The other pits were worked by companies bearing the names connected with the pits. These latter pits were worked by either one or more companies. But in the year 1845 the plaintiff assumed the business of raising coal from these pits, and has carried on the business down to the present time.

It appears that the pits to which I refer are the only collieries in the parish of Radstock, and that the Countess is the owner of all the coal in that district, with three exceptions. One of the exceptions is of certain glebe land which she acquired the right to work, and which, therefore, constituted part of the collieries; the other exception being a small portion of the coal field about, or less than, an acre in extent, which is worked by the Writhlington Coal Company, the owners of an adjoining pit. But the bulk of the coal in the collieries in the parish, and one-half of all the collieries in Radstock, belong to the plaintiff, she being the owner of the five pits I have mentioned. It appears, further, that from the year 1833—certainly from that date, and probably from an earlier period—the Countess was in the habit of carrying on her business at Radstock, and describing herself on her bill heads as in fact the owner of the five collieries, naming them. She described them as "The Radstock Coal Works." I have before me several bill heads furnished by the plaintiff to the defendants, and it appears that that was the mode in which she described her property. She enumerated the pits, and described them as the Radstock Coal Works. On her wagons she described herself as Countess Waldegrave, and her address on the wagons was given as the Radstock Colliery or Coal Works. That went on from the year 1865 to the year 1873. In that year a dispute arose between the plaintiff on the one part and the defendants on the other part, who in the year 1868 or 1869 had commenced a business under the description of the Radstock Coal Company; and what was not unlikely, a dispute occurred with reference to addresses of letters. The question arose to whom letters addressed to the Radstock Coal Company should be delivered, the plaintiff contending that they were letters intended for her, she having for years past described herself as the owner of the Radstock Coal Works, the defendants, on the other hand, saying that the letters were directed to them, they having for five years past carried on business as the Radstock Coal Company. It appears as the result of the dispute that the letters were made to the Post Office, and the letters were directed by the Post Office authorities to be delivered to the defendants. About the same time, in consequence of that dispute, the Countess adopted a new description of her collieries or coal works which she carried on, and in the month of April, or shortly afterwards, she caused the inscription on the wagons to be altered by the defendants, who were acting for her in that respect, and she then described herself as "Countess Waldegrave," Radstock Collieries. Between the months of June and September, in the same year, she altered her bill heads, and instead of describing her property as the "Radstock Coal Works," she adopted the description of "The Right Honourable Countess Waldegrave," Radstock Collieries, and has continued her business from that time up to the present.

Now, it does appear to me that when the plaintiff—I mean the Countess—had directed that change, with the evident design of getting out of the way of the name or style which the defendants had adopted, it did cast upon the defendants as honest and honourable men the obligation not to endeavour to follow the Countess in the footsteps she had taken, so as to avoid confusion. Seeing the confusion which might naturally arise by adopting the words in which the Countess had described her property in the year 1863 and downwards, the defendants ought rather to have leaned in the direction of difference, and not in the direction of similarity. They carried on this double business, which was carried on at Radstock, they used the name of "The Radstock Coal and Wagon Company," and the wagon business they used the name of "The Radstock Wagon Company," and for the coal business which they carried on they used the name of "The Radstock Coal Company." I have mentioned the facts which relate to all that passed anterior to the institution of the proceedings in this case. It now becomes necessary for me to refer to that part of the case which relates to the adjoining collieries. The important facts are these—that the same seams of coal which are worked in the parish of Radstock are found to extend, and anticipated was the case, outside the parish, and that there is a district in which these Radstock seams are worked. There are some six or seven seams well known as the upper seams of that coal field, and they are well known by the name of "Radstock series." The district in which these seams are principally worked is described as belonging to numerous owners of collieries, Radstock being the definition usually adopted to signify the area included—that is, south, east, and west by the outcrop of the Radstock series, and to the north by a tract of faulty, broken, and unexplored ground to the north of the village of Radstock, separating Camerton and Timsbury from the other part—and I will assume that that district is broadly described as the Radstock coal field series, Camerton and Timsbury being intercepted by the broken ground. The evidence leads me to infer that that district is fairly described as the Radstock coal field. On that there are other collieries—no less than nine collieries—at work in that district. They are the Clowdon, the two at Writhlington, one at Huish, one at Braysdown, another at Foxcote, the Old Welton, the Welton Hill Pit, and one at Kelmersden.

It appears that shortly after commencing business the defendants took a considerable portion of the output of the Clowdon, Old Welton, and Welton Hill Pits. About the year 1873 the defendants began to sell coal at Gildford, in Surrey, and it is stated that originally their sale of coals there was in the wholesale trade, which they carried on through an agent, whom the defendants employed. Shortly after the commencement of 1873 they employed as their agent a person named Franks, but in December, 1875, a retail dealer who carried on a coal business in Deptford failed, and the defendants purchased from the trustees in bankruptcy the goodwill of his business. They thereupon establish a branch of their business as retail dealers in coal at Gildford, and they continued to employ Mr. Franks as their agent and manager at their Gildford business, leaving, in fact to him everything with regard to the conduct of the business, except as to the sign-board, to which I shall presently refer. He had, however, everything else left to him, and he was to advertise the business as he thought proper. It was in evidence that it was their custom to advertise their business at the various local depots in those places where they carried on their retail business. In the month of October, 1875, the defendant sent to Franks two sketches of a sign-board, which I have in my hand at this moment, and which they proposed to erect at their depot at the Gildford railway station. I have the originals before me. They were both in the same words—"Radstock Coal Company; Colliery Proprietors, Coal and Coke Factors"—and it is, perhaps, worthy of note, although not very material, that the words "Colliery Proprietors" were in larger letters and more conspicuous than the rest of the inscription. But what is material is that according to the defendants' statement, and this has been borne out with considerable distinctness by what has been said in the witness box, that

description of signboard was generally approved of. Therefore, the assumption is that they were calling themselves colliery proprietors, and the description of them is such at Gildford, and was not an isolated fact in this case, but part of a series of facts, showing the style under which the defendants were carrying on their business. Now, it does not appear to me that the defendants were entitled to describe themselves as colliery proprietors, because I think that expression means the lessors, lessees, or workers of collieries. But they did use the words "Colliery Proprietors," and the question is whether this description of themselves was calculated to, and had a tendency to, deceive. I do not say it would have been by itself, but I think, considering that the plaintiff had adopted that expression, and given up the words "Coal Works" in order to accommodate the public, and to move herself out of the description the defendants had thought fit to use, it was an indiscreet thing, to say the least of it, for the defendants to follow upon her heels, and not to take care not to press their toes upon the heels of others. However, they did that soon afterwards they, for the first time, acquired an interest in the Old Welton Pit—that is to say, they became the lessees of, or held under some agreement, by which they were entitled to work that colliery. This took place in the following year—1876. In June, 1875, they say they were colliery proprietors, because at that date one of the defendants had an interest in another colliery elsewhere, but neither of them had any interest in the Radstock Company until they commenced business at Gildford. On June 2, 1876, it appears the defendant's agent at Gildford put upon the blind of the office this description—"The Radstock Colliery Proprietors Coal and Coke Office." It is said that the word "The" was in smaller letters than the other part, and in a scroll, but still it was legible, and that state of the blind continued from June 2 down to October 26, 1876. I do not think it necessary to pursue the correspondence which passed between the plaintiffs and defendants, and between the defendants and their agent. The defendants complain that they have been deceived by their agent, they having believed that the blind was in terms altered on Oct. 26, but, at any rate, the discovery which they made on Nov. 2 ought to have put them on enquiry as to what their agent had been doing at Gildford.

On Oct. 26 the blind was altered in this way—"Radstock Colliery Proprietors Coal and Coke Office." Now, that form of inscription was undoubtedly suggested, if not justified, by the sketch which the defendants had sent to their agent, the words on the sketch being put on the blind, with this exception, that the words "Coal and Coke Factors" were not repeated. This fact as to the inscription on the blind having come to the knowledge of the plaintiffs, led to a correspondence and to serious complaints by the plaintiffs as to the assumption by the defendants of the words "Radstock Colliery Proprietors." However, the matter does not stop there, for in evidence before me this in the West Surrey Times an advertisement had appeared from the month of December, 1875, and continued to appear down to Dec. 9, 1876, in this form—"The Radstock Colliery Proprietors and Factors, Coal and Coke Merchants, late W. Cookson and Co., for this District, 48, High-street, Gildford, supply direct from the collieries Walsend, Silkestone, house, Welsh, steam, and kitchen coals of every description at lowest prices, especially for cash. Special contracts made for quantities at any station on the South-Western Railway, the South-Eastern, the London, Brighton, and South Coast Railway, the Great Western, or the London, Chatham, and Dover Railway. The Radstock Colliery Proprietors, having their chief office at Radstock, are the persons who had acquired the business of Cookson and Co., as having an office at 48, High-street, Gildford. I must say that I should have thought, on reading that advertisement, that they were proprietors of a colliery or collieries at Radstock, and, more than that, they were entitled to describe and did consider themselves as the principal colliery proprietors in Radstock. It appears clearly that any person reading that advertisement might suppose the supply came from these collieries, because the words are—"Supply direct from the Collieries" Walsend, Silkestone, house, and kitchen coals, which are exactly what the Radstock coals made. Further than that, it holds out that special contracts for quantities may be made, and it is in evidence before me that the supply of coal from the collieries, which I should think, at any rate, includes the collieries at Radstock. Therefore, it appears to me that the defendants by that advertisement hold themselves out as desirous to carry out their business at any of the numerous stations on the lines of railway therein mentioned. That advertisement appeared also in the Surrey Advertiser of Dec. 9, 1876, and I have that paper before me. Then at the end of the year 1875 appeared "Andrews' Gildford Almanack and Directory for 1876," and in that publication the defendants again advertise their business by this description—"The Radstock Colliery Proprietors, Wagon-Owners, and Factors, Coal and Coke Merchants (late W. Cookson and Co.), Office for the District, 48, High-street, Gildford;" and further description very similar to that in the advertisement. The defendants there call themselves "The Radstock Colliery Proprietors, Wagon Owners, and Factors, and Coal and Coke Merchants." That I understand to be the description of the business they carried on. Further than that, an advertisement appears in a local time-table, published on Dec. 1, 1876, and in that I find a very similar description of the defendants—"The Radstock Colliery Proprietors (late W. Cookson and Co.), Coal and Coke Merchants, 48, High-street, Gildford, supply truck loads direct from the collieries at Radstock on the three lines." There is no reference to any colliery in the Radstock Collieries. I cannot help, therefore, coming to the conclusion that they have intended to hold themselves out as the Radstock Colliery proprietors, who supplied coals from Radstock as though they were entitled to do so from the Old Welton Pit.

That was the condition of the advertisement in December 1876, and on the 7th of that month the plaintiff's solicitor, Mr. Macarthur, addressed a letter to the defendants, in which he called their attention to these advertisements, and he said—"As this is doing considerable injury to Lady Waldegrave's trade, and causing much confusion in correspondence, I have to require that the name or title Radstock Colliery proprietors be discontinued to be used by you, as also any name or title, combination of words, likely to mislead the public into the belief that you supply any coals from the Radstock Collieries, as the whole of the collieries in the parish of Radstock belong to, and are worked by, her ladyship. I trust I may by return receive an assurance from you that you will discontinue the use of such misleading names or titles. I will wait until Saturday morning for such assurance, which I trust I may then receive, or the name of your solicitor." That letter was written on the 7th, which was Thursday. On the 8th this letter was written to Mr. Macarthur by the defendants—"Replying to your favour of yesterday's date I must repeat the purport of my previous communication with you, that we are under no legal obligation to comply with your demand as to the modification of the style or name of our firm, or the nature of our advertisement." There is a distinct claim in the letter to the right. The letter then goes on to say—"At the same time we were fully desirous of yielding to any fair and reasonable request on behalf of her ladyship as long as it was courteously preferred, and I altogether fail to see the need on her part of making a legal demand for what might have given us pleasure to have conceded. We deny altogether that we have done any act calculated to damage her ladyship's interest further than what necessarily arises from or out of a fair and legitimate competition in a similar undertaking. We need hardly point out to you that the parish of Radstock is but a small portion of the coal field, and that the Radstock Collieries district, which produces coals well and generally known and sold as the Radstock coals." Then they proceed to argue—"At the same time without admitting any right either morally or legally on your part to dictate to us how we shall conduct our business, or any obligation on our part to yield to your demands, we shall be pleased to comply with any request made on behalf of her ladyship provided we can do so without damage to ourselves—and that you withdraw forthwith the advertisements which we consider have been so unwarrantably promulgated—to correct as you state a mischief which is purely imagination. We write to you in quite plain and unambiguous terms, and we most positively deny you any right to take on behalf of her ladyship, or to any proceedings we may find necessary to institute in reference to the advertisements you refer to as having been published by or on our behalf or otherwise." Therefore, instead of there being any concession to the demand in the letter of the 7th they insist upon their right, although they say they are still willing to make any modification that could be made without damaging their own position. On the 9th a further letter follows from the plaintiff's solicitor insisting upon the withdrawal of the demand, which letter it is unnecessary for me to read.

Upon Dec. 9, there is a letter written by the defendant, who says, "When I met Mr. Macarthur on the 7th I was under the impression that he had for some time discontinued the use of the advertisements." Now, that statement again was clearly false if it were made, because of the 11th being the last day of the week, "without admitting any obligation on our part to discontinue the special form of advertisements to which you seem to have such an objection, I may inform you that we had not the slightest idea that our Gildford agent had adopted such until Mr. Macarthur brought it to our notice, and we had a correspondence on the subject. So far from our courtesy being a mockery, we at once gave orders for the advertisements to be discontinued. I will admit we did this more on account of the undesirability of the thing than otherwise, because of Mr. Macarthur's assumption of a right to compel us to do so. I must most positively deny you any assertion that we have adopted any new names in the manner you intimate, and if we had you could not complain, seeing the arbitrary way in which Mr. Macarthur has generally conducted the correspondence on behalf of her ladyship, and that we have an equal right with her to conduct our business in any way which we may think best without infringing the rights of others." They say they have done what was sufficient, and say they have given orders for the advertisements to be discontinued. Now, Mr. Bagshawe, on behalf of the defendants, said that instructions had been given by them to discontinue the advertisements on Dec. 9, but immediately after that the advertisement appeared again—that is, on Saturday, the 11th. Therefore, if those orders had been given they were not carried out. It being Thursday when the orders were said to have been given, and as the advertisement appeared again on Saturday, the 11th, I think, therefore, the plaintiffs were perfectly justified in issuing their writ on Dec. 13; and, in my opinion, if the defendants wished to avoid proceedings they ought to have resigned the issue of those advertisements.

It does not, however, stop there, because it appears that either from the careless or improper conduct of the defendants or their agents on Jan. 27, 1878, nearly a month after the writ was issued, they gave orders, which they say they are described as "The Radstock Colliery Proprietors." It is said on behalf of the defendant that that was done by mistake. There had been several mistakes in the case, beginning with the defendants describing themselves as The Radstock Colliery Proprietors and Coal Factors, and the agent using the words, "The Radstock Colliery Proprietors." Simplicity in the advertisement and cards, which were never withdrawn, the letters of the defendants throwing the blame of this upon the agent, and now in this Court the blame as to the cards is thrown upon the office-boy, but on no occasion have the defendants acknowledged the right to have the words objected to discontinued. Having now stated the facts of the case, it becomes necessary to consider more at length what was the nature of the defendants' defence, because it appears to me that the plaintiff was the sole owner of the collieries in the area of the parish of Radstock, and, therefore, presumably entitled to call herself the Radstock Collieries proprietor, and so entitled to restrain any person from infringing or interfering with her right, and entitled to describe herself alone as the actual proprietor of the Radstock Collieries. The case for the defendants is this. It is said, and said truly, that there is in this district a series of beds of coal, which I have referred to already as the Radstock series, and it is said that the whole of that series is the Radstock Basin. That is true to a large extent. It is true that at any rate until you reach the face of the north where the basin is worked there is found the Radstock coal. That is true in this sense, that although not at the pit's mouth and in the immediate neighbourhood, still in the Bath markets, and in the markets in the South and West of England, the whole of that coal in that business is known as the Radstock coal. It is said that wherever there is Radstock coal there are Radstock collieries. But that does not entitle the workers of that coal to call themselves owners of collieries at Radstock or Radstock colliery proprietors. It does not follow that where the Radstock coal is found the workers of it are entitled to describe themselves as the Radstock Colliery proprietors, nor, in my opinion, to de-

scribe themselves as the owners of collieries at Radstock. If this had been the case of a person selling Radstock coal, or raising coal in the Radstock district, that would have been a very different consideration, but that is not the case before me.

That is the general nature of the first part of the defence, but it must be borne in mind that in this case there are two things to be considered, first the case of the expression of the Radstock Colliery proprietors. It appears to me that that expression must mean one of two things. They must either mean all the colliery proprietors who work in the Radstock Basin, or it must mean the plaintiff as being *par excellence* the person owning and working the Radstock Collieries; I have had both of the views put before me by the witnesses of the defendants themselves. One gentleman said, when giving his evidence on that point, that sometime in the year 1871, when the proprietors of collieries in the district combined together, I believe, in support or opposition to a railway they were spoken of as the Radstock Colliery proprietors, and that was the only time he knew the expression to have been used. If that be so, it is far from being clear to my mind that the plaintiffs are not entitled to bring their action, because it appears to me that if the expression used included the whole of those proprietors, it certainly included the plaintiff Countess, who was by far the largest of them, because from the evidence in this case more than half of that coal which was sent from Radstock was raised from her collieries. It would certainly amount to this—a declaration by the defendants that they were selling the coal of all these proprietors, and, therefore, selling the plaintiff's coal. It appears to me that by the title of "The Radstock Colliery Proprietors" the defendants represented themselves to be the proprietors of the whole of the plaintiff's collieries, and there is no doubt she would have a right to restrain the defendants from doing that wrong, nor does that wrong appear to me to be any the less from the fact that there are other collieries in the Radstock Basin or district. I have no doubt in my mind that the result of my using that title would be to create an impression on the mind of any ordinary person that the defendants represented themselves as proprietors of collieries in the Radstock district because the defendants chose to adopt that title.

Mr. Bagshawe, for the defendant, contended that the use by the defendants of the generic name or title of Radstock Collieries would not entitle the plaintiff to maintain an action for the use of it; but it must not be forgotten that the genus includes the species, and that if you assume the genus you assume the species, and by adopting the name the defendants did they represented themselves as selling the coals of the plaintiffs and other persons, which came under the description of Radstock coal. That I think is wrong. The other view which was adopted by some of the defendants' witnesses was, that if you speak of the Radstock coal proprietor or proprietors, every body would consider that it meant the Countess Waldegrave, and for this reason, because, like the companies who worked the Radstock coal in the Radstock basin, she worked the Radstock coal, and she alone worked the Radstock coal in the Radstock parish. It is in evidence that she worked, and she alone, from 1833 to 1873, under the name of the Radstock Coal Works. From 1873 downwards she used the style of the Radstock Collieries to describe the property, and she was undoubtedly the largest worker and shipper of coal in that district. If that be true a wrong was undoubtedly done by the defendants. I think, therefore, the defendants were wrong in describing themselves as the Radstock Colliery proprietors, and that they did. They called themselves so by some of their advertisements, and they contended that there is not the slightest ground for complaint for the use of the words Radstock Colliery proprietors. The next matter to be enquired into is this: the defendants expressly claim the right to describe themselves as the proprietors of collieries or coal mines at Radstock, which they say they are entitled to use and intend to use. Now, with regard to this, it appears to me there is a great distinction between Radstock Colliery, which may mean a colliery in the district, and a colliery at Radstock, because that means, in my opinion, a colliery within the parish of Radstock, and I do not believe that the parties have given the same to the coal in the Radstock series. The defendants, therefore, in my opinion, are liable to be restrained by the plaintiff from trading by a description which enables them to represent that the coals they are selling are coals raised from the works of the plaintiff Countess. It has been said and earnestly pressed by the defendant's counsel that there is no evidence of damage in this case. In the first place I am of opinion that it is not necessary to prove damage where the thing done by the defendants in the opinion or judgment of the Court has a tendency to enable them to deceive by selling, as and for the plaintiffs, their own goods. I am of opinion in this case that there is a tendency to deceive, and that proof of special damage is not necessary, as determined by Lord Hatherley when Lord Chancellor, in Dent's case. Then it is said it is ridiculous to suppose that any harm could arise to the plaintiff at Gildford, where no one thought of buying her coal; but I must consider that the defendants adopted the title for some adequate motive, and what could that motive be but to introduce their goods into the market at Gildford, I do not know. I have this in evidence, however, so far back as the year 1870. The predecessors of the defendants, Cookson and Co., applied to the Countess to be appointed agents for the sale of Radstock coal at Gildford, and I see by the evidence that that offer by Cookson and Co. was refused on the ground of the breach of gage between the Great Western and the South Western Railways. Since that time, however, that difficulty has been removed, and since 1873 it has been quite possible to send Radstock coal by railway direct to Gildford. Further than that, I cannot help observing that the defendants' advertisements offer to carry on business outside Gildford, and the lines of railway are mentioned in the advertisements, and amongst others the Great Western Railway. It is also in evidence before me that Radstock coal is sent by the Great Western, and goes west as far as Bristol and east as far as Swindon and Reading; therefore, the advertisement does not confine itself to Gildford, but proposes to deal in coal at those stations which are in the lines of railway mentioned. I cannot, therefore, refuse the plaintiffs' right to relief on the ground of want of proof of damage actually accruing.

I believe I have now considered all the main points relied upon by the defendants in this case. In my judgment, the two expressions which I have referred to—the description of themselves as "the Radstock Colliery proprietors," and as the owners of collieries at Radstock—are both of them unjustified, because proof has been given that they are both calculated to deceive, by enabling the defendants to sell as and for coal raised by themselves. I, therefore, grant the injunction in the terms I have already indicated. The reason why I refuse to grant the larger injunction prayed for will be apparent from the terms of this judgment. I am not prepared to say, and I do not think it should be decided, that the expression "the Radstock Collieries" has been acquired by the Countess plaintiff as her trade mark. But I grant the injunction upon the ground that the acts of the defendants enable them to commit a fraud by misrepresentation on the plaintiff. The only remaining observation for me to make is as to the costs. It appears to me to have been substantially proved that the plaintiff has been right and that the defendants have been wrong. I cannot admire the conduct of the defendants in pursuing the names adopted by the plaintiff in the manner they did. I do not admire their correspondence, and I think I should be giving a measure of justice short of that the plaintiff is entitled to if I were not to give the whole of the costs of the litigation, including the cost of the motion, and I accordingly grant the injunction I have mentioned with costs.

Mr. FISCHER: As a matter of form, I presume.

Mr. JUSTICE FRY: I must mention this, that in point of form I have said "until they have acquired an interest;" perhaps it ought to go a little further, and say "unless and until they have acquired an interest, or shall have entered into a contract for the purchase of coals raised or gotten within the parish of Radstock." Supposing the defendants were to purchase that acre at Writhlington, and were to work that coal, then the defendants might very well represent themselves as authorised to sell and supply coals raised from a colliery at Radstock.

Mr. BAGSHAWE: The injunction will be "to restrain the defendants, their agents, and servants, unless and until—"

Mr. JUSTICE FRY: They shall acquire a colliery within the parish of Radstock.

Mr. BAGSHAWE: "Or shall acquire."

Mr. JUSTICE FRY: I think, in order to be quite strict, the injunction ought to be disjunctive. It will, therefore, require a little care, and the injunction will be "to restrain the defendants, their agents, and servants, unless and until the defendants shall acquire a colliery or coal mine within the parish of Radstock, in the county of Somerset, from trading under or using the name or style of the Radstock Collieries, or any other name or style signifying that the defendants, or any one of them, are proprietors of any colliery, or collieries, at Radstock." And also an injunction to restrain the defendants, their agents, and servants from selling or supplying, until they shall become authorised to sell or supply, any coals raised or gotten from any colliery or coal mine within the parish of Radstock; and from using any style or name signifying or implying that the defendants are selling or supplying any coal raised or gotten from any colliery or coal mine within the parish of Radstock.

Mr. FISCHER: There are two injunctions, in fact.

Mr. JUSTICE FRY: Yes, two.

Mr. BAGSHAWE: The second will be to restrain the defendants until they shall be authorised.

Mr. JUSTICE FRY: Yes, from selling or supplying as coals raised or gotten from a colliery or coal mine within the parish of Radstock, and from using any name or style signifying or implying that the defendants are selling or supplying, or are authorised to sell or supply, coals raised or gotten from any of the collieries or coal mines at Radstock.

Mr. FISCHER: Will your lordship be good enough to give that to the Registrar?

Mr. JUSTICE FRY: No; certainly not, because it does not accurately express what I am now saying, so that instead of the paper being regarded it must be discarded.

Mr. BAGSHAWE: Will your Lordship give us any intimation as to what name we should be allowed to use?

Mr. JUSTICE FRY: Certainly not; I have nothing whatever to do with that.

Solicitor for the Plaintiffs and for Lord Carlingford—Mr. J. R. Macarthur. Solicitors for the Defendants—Messrs. Beachim and Gullick—Vallance and Vallance, for Murly and Sons, Bristol.

LAMPS FOR ELECTRIC LIGHT.—The improvements proposed by Messrs. PROSSER and MOORE, of Chelsea, consists in the modes of combining and mounting the electrodes, also in the mode of forming them, and in the means of bringing them successively into action in such manner as to prevent the suspension of the current of electricity and consequent extinction of the light, arising either from defective electrodes or other accidental causes. The extinction of the light would, therefore, be entirely avoided, and the electric current, together with the light, be automatically maintained. As by our ordinary modes of arranging the electrodes we require only two electrodes to be in action at one and the same time, we cause those not in immediate action (where we employ a plurality of them) to be completely insulated, and cause the electric current to pass through the opposing electrodes, the electric fluid being conducted through an ordinary feeder from the battery, and connected with the electrodes

by means of a spring commutator or other connector of platinum or other suitable metal, which, preserving contact by pressing upon the electrodes in immediate action, is so arranged and adjusted that when it is necessary to change or shift the electrodes from any cause, contact shall at once be effected with the succeeding electrode, so that the perfect continuity of the electric current, and consequently of the light, shall be maintained.

ON A NEW METHOD OF BALANCING THE ENGINES USED IN WINDING FROM THE DEEP SHAFTS OF WESTPHALIA.

By W. FAIRLEY, Mining Engineer, and Certificated Colliery Manager.

That was a curious piece of experience when the writer, a few years back, under a peculiar state of affairs, was compelled to wind coal from a deep shaft in Westphalia, with only one cage, and with a large single-cylindrical, high-pressured, first-motioned engine. The true circumstances were these—depth of shaft, 116 fathoms, equal to 132½ fathoms; engine-cylinder, 42 in. diameter; stroke, 5 feet; let motion: a balance-weight being hung in the pit from a smaller drum on the same axle as the large winding drum, this weight, for want of room, could only run about 55 fathoms, or less than half the depth in the bottom part of the pit, as the greater portion of the shaft was taken up with various sets of pumps, timber, and brattice. The cage ran in wire-rope guides, and, as might be expected, oscillated most alarmingly when running. Of course the arrangement was only temporary, and fortunately did not last long, but it had its lessons; amongst others, one most decisively was that wire-rope guides are most unsuitable with an engine of only one cylinder, drawing an unbalanced load. In another case, under the same firm in that district, the wire-rope guides worked well, and the cages ran in them very steadily, the machinery being worked by a pair of engines.

Since his return to this country the writer has, as far as possible, kept himself posted up in the progress of mining engineering in that great coal field, and most recently had some correspondence with a practical mining engineer there, Herr Gehres, manager for the Westphalia Colliery Company, on the subject of balancing engines in winding, and as that gentleman has gone so thoroughly into the details of the subject he is now enabled to present to the readers of the *Mining Journal* the following particulars of what has been done in this respect by the Germans.

The attempts in a general way which have hitherto been made to balance the winding-ropes are pretty well known, and reference only need here be made to flat ropes and spiral drums, which have been tried on the largest scale. The flat ropes have, however, been found to have so many disadvantages, particularly in very deep shafts, that they have only been used in isolated cases. The spiral drum has been looked upon very favourably, and in this neighbourhood for a time most of the new collieries have been fitted up with it; its day is now past, as is proved by its imperfections. It is not necessary to discuss this further here, but we will proceed to mention a new method of balancing, which in all probability has a greater future than anything that has yet been tried. At Hanover Colliery, by Wattenscheidt, the old winding arrangements have been altered by removing the hitherto used conical drum and replacing it with a single sheave of 7 metre (say 23 ft.) diameter attached to the main shaft of the engine. The periphery consists of timber, which is provided with a notch to receive the rope. A rope is passed over this sheave A (see Figs. 1 and 2), each end of

Fig. 1.

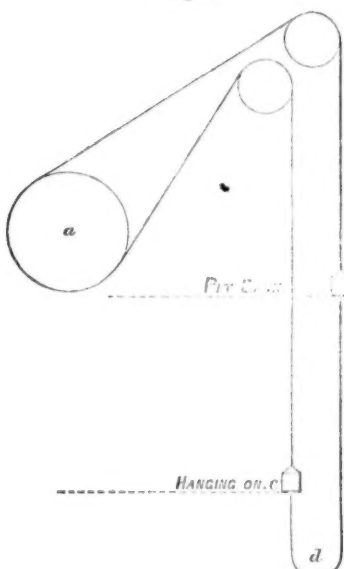


Fig. 2.

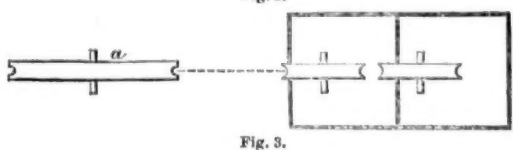
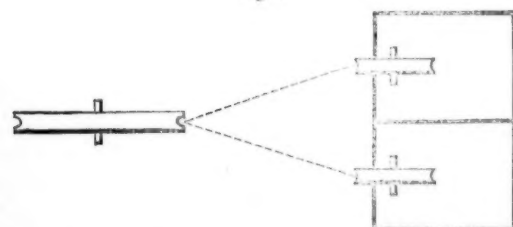


Fig. 3.



which after passing over the rope-pulleys is attached to the cages B, C, Fig. 1. To the bottom of each cage a rope (called the balance rope) is attached of the same dimensions, and consequently same weight as the winding-rope, so that two ropes are always hanging in the shaft, which act mutually as a counter balance. This winding arrangement works in the simplest manner, and with the least application of power, which in winding has certainly a great dead-weight and somewhat of friction, but only the net weight of the coal to lift.

At the above-mentioned colliery this answers well, and, indeed, with an old single-cylindrical machine. It has not been found necessary to fix a sheave under the hanging-on at d (Fig. 1) for the balance-rope, because the rope has worked well without it. The position of the machine in respect to the shaft was certainly favourable here, because both of the rope-pulleys were in a line over each other (see Figs. 1 and 2), which may probably not often be the case. The introduction of this system is rather more difficult when the relative position of the machine and shaft is different from that mentioned above, which is probably generally the case, particularly in newly laid out works, where the distance from the winding machine to the shaft is not great (as in Fig. 3), or in the alteration of old plant, where these unfavourable conditions are generally to be encountered.

The advantages of this arrangement catch the eye, and are indisputable, and it is wonderful that the plan has not been carried out long ago, although similar plans of balancing were known. In

this, however, we have disadvantages to consider, and the principle is that only one rope is used. Everyone with experience in these matters knows that the winding-rope is most injured at the lift where the rope touches the pulley. In ordinary arrangements this difficulty is overcome by cutting the rope and altering the length, so that another part of the rope comes in contact with the pulley. This, however, is impossible in this case, even by joining a piece of chain, as the rope must preserve its fixed length. Of course the rope could be spliced, but this with a thick rope of great strength and for a great depth would be difficult. The use of only this one rope is generally so much trouble that it will in the end become as dear as by one of the following arrangements with two ropes.

The whole contrivance is very simple; if we turn away from the sheave on the axle, and make the arrangement suit the existing machinery by using the two old drums instead of one sheave, the advantage will be that the old ropes can be used, and that there will be two ropes instead of one; for the balance rope an old worn-out rope may be used. We will, therefore, look upon the existing drums as for round ropes—i.e., spiral, conical, or cylindrical drums. We must look upon spiral drums as different from the others, as by their construction balancing is to some extent possible. As the conical drum is nearly universally in vogue in this district, it requires the most of our consideration to take advantage of it. It is necessary to decide whether by the continual change in the diameter of the drums the difference in length in the two ropes is not too great, which will give a greater velocity to the balance rope, and possibly endanger the shaft or cages. We will take into calculation two rope drums, the largest circumference being 15 and the smallest 12 metres, and having 25 coils of rope—i.e., wound on and off. The complete run of the cage or journey will be divided into 26 parts, so that the first part is at the beginning of the journey, the second at the finish of the first stroke, or on and off winding of the first coil, part three the finish of the on and off winding of the second coil, &c. The length of rope or depth of shaft from bank-head to hanging-on is 337½ metres. In columns b and d the lengths of the ropes as they are wound on and off on each round of the drum are given. In columns c and e the length of the balance rope under each cage is given to the hanging-on, and in column f the total length of the two sides is given. Column g shows how much of the balance rope at each side of the shaft is hanging under the hanging-on. Now, as the whole of the balance rope has the same length as the winding rope—i.e., 337½ metres—the figures in column f show that the whole of the balance rope cannot be above the hanging-on, and therefore a portion of it must be suspended below in the pit bottom. In column g it is to be seen how rapidly the balance rope is lengthened in unwinding and shortened in winding, first at the commencement and lastly at the end of the journey, by which certainly for a short time a rather quick velocity is attained, whilst in the middle of the journey the balance rope is pretty well proportioned.

Strokes or coils.	Descending rope.		Ascending rope.		Length of the balance rope on each side of the shaft above the hanging-on.	Length of the balance rope hanging on each side.
	Length from pit bank downwards.	Length of balance rope hanging on.	Length from pit bank downwards.	Length of balance rope hanging on.		
a.	b.	c.	d.	e.	f.	g.
1	—	337-500	337-500	—	337-500	1-500
2	15-000	322-500	325-500	12-000	334-500	2-875
3	29-875	307-625	313-375	24-125	331-750	4-125
4	44-625	292-875	301-125	36-375	329-250	5-250
5	59-250	278-250	288-950	48-750	327-000	6-250
6	73-750	263-750	276-250	61-250	325-000	7-125
7	88-125	249-375	263-625	73-875	323-250	7-875
8	102-375	235-125	250-875	86-625	321-750	8-500
9	116-500	221-000	238-000	99-500	320-500	9-000
10	130-500	207-000	225-000	112-500	319-500	9-000
11	144-375	193-125	211-875	125-625	318-750	9-375
12	158-125	179-375	198-625	138-875	318-250	9-625
13	171-750	165-750	185-250	152-250	318-000	9-750
14	185-250	152-250	171-750	165-750	318-000	9-750
15	198-625	138-875	158-125	179-375	318-250	9-625
16	211-875	125-625	144-375	193-125	318-750	9-375
17	225-000	112-500	130-500	207-000	319-500	9-000
18	238-000	99-500	116-500	221-000	320-500	8-500
19	250-875	86-625	102-375	235-125	321-750	7-875
20	263-625	73-875	88-125	249-375	323-250	7-125
21	276-250	61-250	73-750	263-750	325-000	6-250
22	288-750	48-750	59-250	278-250	327-000	5-250
23	301-125	36-375	44-625	292-875	329-250	4-125
24	313-375	24-125	29-875	307-625	331-750	2-875
25	325-500	12-000	15-000	322-500	334-500	1-500
26	337-500	—	—	337-500	337-500	—

Now, as the balance rope is suspended in the pit bottom to the extent of 9.75 metres (not reckoning a few metres for turning round and fastening), the shaft must be that much deeper. From the foregoing it must be seen that the balance rope can be used with conical drums, when the shaft is sufficiently deep under the hanging-on; the balancing will, of course, not be so complete that only the net weight of the load is to be heaved, because the altered leverage of the rope drum requires a change in the power of the engine. This is, however, inconsiderable, as by conical drums the difference in the length of leverage is not great; there will always be a good deal of engine power saved, and the working of the engine will be steadier and more regular.

In conclusion, we now come to the consideration of cylindrical drums, consequently two ropes again, and the connection of the cages beneath with a balance rope. This arrangement is in all cases most suitable for this mode of balancing, as the ropes are wound up and down quite regularly; therefore, the balance rope has always the same length, and the power required from the engine is constantly the same. In this case we need not go into figures, as it is clear enough that the working is in the same manner as that of the sheave above described, but without its disadvantages.

In respect to Westphalia, Herr Gehres says there will certainly not be many more cylindrical drums, as wherever great depths are attained the conical drum has been established, and in the future introduction of this system of balancing, which is sure to take place, its inconvenience must be taken into consideration along with its cost. Finally, the writer may remark that one great advantage in the balance-rope system is that the cages are certain to run steadily, and, consequently, facilitate the use of wire-rope guides, which under favourable conditions are cheaper and more convenient than wood. If the English mining engineer thinks proper to introduce this plan, which from its practical application at Wattenscheidt seems recommendable, his ingenuity will undoubtedly discover the means of overcoming the difficulties attending its use, above referred to.

STEAM-PUMPS AND PUMP-ENGINES.—With a view to render direct-acting steam-pumps having rams working in glands double-acting, and thereby increase their practical effect, Messrs. G. and E. ASHWORTH, of Manchester, under a former patent arranged the ram to work within two ram chambers, the upper end of the ram being connected by means of a rod with a triangular frame, within which worked the connecting-rod which connected the piston-rod and ram with a revolving crank shaft. In this arrangement the height of the machine was greatly increased as compared with single-acting pumps, and the ram glands were not conveniently accessible for packing and adjustment. To remedy these defects is the principal object of their present invention. To this end they arrange the upper ram chamber immediately below the steam cylinder, the piston-rod of the said cylinder passing through the cylinder gland into and through a gland on the upper part of the said chamber. The lower or outer end of the said piston-rod is firmly pinned, cottered, or attached to the upper end of the ram. The said ram

works in glands and stuffing-boxes on the lower end of the upper chamber and the upper end of the lower chamber, and to a part of the said ram which reciprocates between the two glands, but does not enter either of them, is secured a pin, which projects from one side of the ram, and receives one end of the connecting-rod. The said pin is attached to or connected with a block, which is fitted to slide between vertical slide bars. The other end of the said connecting-rod is mounted upon the crank pin of a crank shaft, which is fitted to revolve in bearings, and is provided with a fly-wheel, as is usual. In some cases they employ only one slide bar, or a rod upon which a block is fitted to slide. The pump is provided with suitable suction and delivery valves.

FURNACES FOR TREATING METALS.—The invention of Mr. J. J. STORER, of New York, consists in constructing puddling, heating, melting, or roasting and similar furnaces with continuously curved internal surfaces at the roof and sides, excepting at the parts occupied by the working doors; also in constructing the said furnaces with small fire-boxes or gas generators for the primary heating of the furnace, and for the ignition of the pulverised fuel used in the same; also in constructing such furnaces with a low and broad flue or opening over the flue bridge, and with an opening in the rear wall of the furnace, through which opening pulverised fuel may be injected over or through the fire-place. The said invention also consists in providing the top or roof of such furnaces over the flue bridge with a metal box or bosh, to be supplied with water when it is especially desirable or necessary to prevent the rapid destruction or burning out of the top or roof of the furnace at that point. The invention also consists in providing water boshes to prevent excessive consumption or waste of fuel, or of lining, which might otherwise result from the intense heat of the combustion of powdered or pulverised fuel. It also consists in the arrangement and use, when desirable, of hot blast-pipes, for the purpose of supplying heated air to the furnace in connection with pulverised fuel. And it further consists in the application of these improvements, or such of them as may be desirable, to existing puddling, heating, melting, and roasting furnaces of any form or construction.

ADVANCE BORE-HOLES.—To ensure safety in boring through coal or rock in advance of the workings, for ascertaining the condition of the advance workings and warning the miners of approaching danger, Mr. A. UPWARD, of Westminster, proposes to employ a drill which passes through a packed gland in the centre of a hollow chamber, which is made to fit gas and water-tight on a cylinder. On the side of this cylinder there is fixed a slide valve, which is made to move across the cylinder after the hole is made through the coal, &c., and the drill brought up into the hollow chamber. On the bottom of this hollow chamber, just below the slide valve, there is a flange for the purpose of forming a gas or water-tight joint between it and the face of the coal, rock, or other material about to be operated upon, by means of an interposed packing of soft material. This apparatus is to be securely fixed to the face of the coal, rock, or other material by any convenient means, but he suggests its being so fixed by means of two pieces of strong timber or T-iron bar let into the floor and roof of the mine, and securely fixed thereto, and thus forming two perpendicular struts which will form sufficient resistance, against which the apparatus can be wedged or otherwise fixed against the face of the coal-rock, &c., &c., which is about to be operated on. As the boring progresses the stem of the drill may be lengthened from time to time; the materials also which are cut away by the drill may from time to time be removed from the boring. The drill may be worked either by manual labour or by steam or other power.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received February 4, 1878, ex Minho (s.), dated Morro Velho, Jan. 2:—

GENERAL REMARKS.—The produce for the second division of December—a period of eleven days, has amounted to 16,816 oits. = 1-38-6 ozt. troy. It has been derived as follows:—

	Oits.	Tons.	Oits. per ton.
General mineral	8,298-5	from 1420	= 5-844
Mineral free from killas	6,688-5	"	= 8-132
Illingworth stamps (Praia)	617-0	"	= 5-067
Hockin's stamps (Praia)	333-0	"	= 4-288
Retreatment	15,917-0	"	= 6-529
	899-0	"	= -398
Total	16,816-0	"	= 6-897

Equal to 1938-6 ozt. troy = 7951 ozt. troy per ton. Or if estimated at the former rate of tonnage—16,816 oits. from 2020 tons, equal to 8-324 oits. per ton, or quite equal to former average of produce. It has been found by actual weighing of the mineral that its weight has been hitherto much understated, the mine wagon having been estimated at 0-80 tons, whereas its actual weight is 1-00 ton. The exact weight will in future be given. The foregoing return of produce is satisfactory—1538 oits. per diem.

Advices received Feb. 14, 1878, ex Tagus, dated Morro Velho, Jan. 18, 1878:—

GENERAL REMARKS.—Throughout the month our general operations have been carried on without any special interruption. The Christmas holidays and heavy falls of rain somewhat interfered with the regular attendance of borers and mechanics, but withal the daily average of both has been fairly maintained, and the results generally in all the departments highly satisfactory. Provisions continue scarce. From the neighbouring districts the report is favourable, abundant crops of the principal breadstuffs being generally expected.

The produce of gold for December is the highest since March, 1876, and exceeds that for November by 3274 oits.

GOLD PRODUCE FOR THE MONTH OF DECEMBER.—The produce extracted during the above period amounts to 45,684-2 oits. = 5268 ozt. troy. It has been derived as follows:—

	Oits.	Tons.	Oits. per ton.
General mineral	21,492-6	from 3761	= 5-715
Mineral free from killas	18,550-8	"	= 8-146
Praia stamps	3,192-9	"	= 5-443
Retreatment	43,536-3	"	= 6-536
	2,147-9	"	= -322
Total	45,684-2	"	= 6-858

Equal to 5268-6453 ozt. troy = 7906 ozt. troy per ton. REDUCTION DEPARTMENT.—The stamping duty shows also a good return, the quantity of mineral treated being larger by 1041 tons. The assay value of the total tonnage gives an improvement of 1-2 oltavas, but owing to a still higher computation of the wagon weight per load of mineral, now estimated at about 1 ton per load, the average per ton as given above is lower by 0-638 oltavas. A comparison made, taking the wagon weight between 0-75 and 0-85 of a ton, as formerly calculated, will show at a glance that as regards the actual value per ton of the mineral body there is no falling off.

At the Praia stamps 12 more heads have been put to work, making in all 40. For a separate amalgamation of the now increased quantity of sand two amalgamating barrels and saxes, with the required straking area, are in course of erection. Appliances also are being made for the purpose of sand concentration, all of which are in a forward state.

COST AND PROFIT.—The produce for Dec. being 45,684-2 oits. Less loss in melting into bars..... 354-4 " 45,329-8 at 7s. 9d. per olt. = £17,571 10 0 Cost..... 7,063 7 4 1/2

Profit..... £ 8,908 2 7 1/2 Exchange compared with last month is one farthing higher, equal to 754. 17s. 4d. on the total cost.

MINES. Mineral raised from mine..... 6881 wagons. Quarried per borer..... 2-01 Average number of borers daily..... 132-96 Average number of natives daily..... 199-68

The above duty is large, and the average of force quite equal to any of the preceding months.

SUMP AND STOPES "A" AND "B" 278.—The above sections have yielded a fair return of good mineral but little alteration in either size or quality. The rate of sinking is a trifle under that for the previous month, some slight interruptions having occurred during the placing of the remaining supports against the south wall. Both walls in these sections have been cleared of all mineral, and are now firmly secure. In the sump sufficient depth has been obtained for another stope, which during the current month will proportionately add to the output of pyritic mineral available at this point.

LEVEL ABOVE SUMP.—Owing to an increase of force both driving and stoping has been simultaneously carried on.

The width of the pure mineral in the forebrest has somewhat decreased, the increasing northerly direction of the intrusive body of killas from the south wall again causing a general contraction of both pure and mixed contents of lode. A limited amount of mineral has been raised from the stope in the bottom of the level.

EASTERN DRIVING UNDER ROOF AND STOPES 236 B shows no alteration; advance for the month 3 ft. 6 in. The stope has been extended to section 237 A, from which the extraction of mineral has been large. At its lower part the lode is promising and of good produce; but as extension is made towards 217 A, or bottom of level, now forming part of the same stope, the width of the general body becomes proportionately less, corresponding with that met with in the driving. The stoping of this upper contracted part of the eastern reserves has already been explained.

STOPES 277 Band 267 C.—The supply of first quality stone is quite equal to that

WATSON BROTHERS' MINING CIRCULAR.

Ten years ago the weekly information which had previously been published for a great number of years in *WATSON BROTHERS' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and sharedealing than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

WATSON BROTHERS,

MINEOWNERS, STOCK AND SHARE DEALERS, &c.,
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

CLEMENTINA.—The agent writes that now the winze has been communicated from the 25 to the 34 he will soon be in a position to make good returns of lead, and expresses his strong opinion that it will become a good profitable dividend-paying mine. It is necessary, however, to have another water-wheel, and extend the dressing-floors, and for this purpose new shares will be created.

SATURDAY, FEB. 9.—Market very quiet. Carn Brea, 39 to 41; Dolcoath, 30 to 32½; Tincroft, 11 to 12; South Condour, 9 to 9½; Van, 28 to 30; D'Eresby Mountain, 10 to 10½; Great Laxey, 20½ to 21½; Leadhills, 3½ to 4; West Chiverton, 18½ to 19; Roman Gravel, 7½ to 8; Rookhope Lead, 17s. to 18s.; Tankerville, 3½ to 4; Parys Mountain, 8s. to 10s.; Grogwin, 3½ to 4; West Wye Valley, 3½ to 4; Richmond, 8½ to 9; Eberhardt, 6½ to 7.

MONDAY, FEB. 11.—Market very inactive, and prices, therefore, are nominal. Carn Brea, 39 to 41; Devon Great Consols, 3 to 3½; Dolcoath, 30 to 32½; D'Eresby Mountain, 10 to 10½; East Van, 2½ to 3; Grogwin, 3½ to 4; Great Laxey, 20½ to 21½; Leadhills, 3½ to 4; North Laxey, 4s. to 5s.; Parys Mountain, 8s. to 10s.; Penrith, 4s. to 5s.; Roman Gravel, 7½ to 8; Rookhope, 17s. to 18s.; South Condour, 9 to 9½; Tankerville, 3½ to 4; Tincroft, 11 to 12; Van, 28 to 30; West Chiverton, 18½ to 19; West Pateley Bridge, 13½ to 14; Agar, 3½ to 4; Grenville, 2 to 2½; Pever, 6 to 6½; Wye Valley, 2 to 2½; West Wye Valley, 3½ to 4.

TUESDAY, FEB. 12.—Market dull, and prices about the same as yesterday. **WEDNESDAY, FEB. 13.**—Although there is very little business doing, shares in good lead mines are firm, at quotations. D'Eresby Mountain, 10 to 10½; Van, 28 to 30; Great Laxey, 20½ to 21½; Roman Gravel, 7½ to 8; Grogwin, 3½ to 4; Leadhills, 3½ to 4; West Chiverton, 18½ to 19; Tankerville, 3½ to 4; Rookhope Lead, 17s. to 18s.; East Van, 2 to 2½; Parys Mountain, 8s. to 10s.; Devon Great Consols, 3 to 3½.

THURSDAY, FEB. 14.—Market very dull, and prices nominal. Carn Brea, 39 to 41; Devon Great Consols, 3 to 3½; Dolcoath, 30 to 32½; East Van, 2 to 2½; Grogwin, 3½ to 4; Great Laxey, 20½ to 21½; Leadhills, 3½ to 4; Parys Mountain, 8s. to 10s.; Penrith, 4s. to 5s.; Roman Gravel, 7½ to 8; Rookhope Lead, 17s. to 18s.; South Condour, 9 to 9½; Tankerville, 3½ to 4; Tincroft, 11 to 12; Van, 28 to 30; West Chiverton, 18½ to 19; Agar, 3½ to 4; Grenville, 2 to 2½; Pever, 6 to 6½; Wye Valley, 2 to 2½; West Wye Valley, 3½ to 4; Chontales, 10s. to 12s.; Eberhardt, 6½ to 7; Flagstaff, 12s. 6d. to 17s. 6d.; Richmond, 8½ to 9.

FRIDAY.—Market continues very inactive, and there is little change in yesterday's quotations.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

MANSFIELD STONE AND BRICK COMPANY (Limited).—Capital 20,000l., in 100 shares. To acquire the business of Messrs. Millott and Metham, stone merchants, &c., of Mansfield. The first seven subscribers are—Thos. Fish, Nottingham, builder, 100; E. Hind, Nottingham, builder, 75; C. J. Lewis, Nottingham, builder, 50; G. F. Bight, Nottingham, builder, 75; J. Hodson, Nottingham, builder, 50; T. Millott, Mansfield, stone merchant, 100; F. Messom Nottingham, 50.

SANTAS COMPANY (Limited).—Capital 100,000l., in 500 shares. To acquire the business of the Santas Company, the proprietors of disinfectants, &c. The subscribers (who take one share each) are—C. G. Kingzett, 5, Palsgrave place, Strand; N. Zingler, 19, Buckland crescent, N.W.; E. Durns, 67, Moorgate street; J. Martin, Price Villa, Shepherd's Bush; John Brown, Darnley Lodge, Dulwich; J. M. Bells, The Bower, Forest Hill.

HARROGATE HYDROPATHIC COMPANY (Limited).—Capital 40,000l., in 100 shares. To acquire the Swan Hotel, Harrogate, for the purpose of converting it into a hydropathic establishment. The subscribers are—A. Pringle, Grove Park, Liverpool, 200; E. Burden, Upper Parliament street, Liverpool, 50; D. Hulton, Liverpool, 100; D. Butterworth, Southport, 100; R. W. Hill, Queen street, Edinburgh, 100; J. M. Henderson, Amble, 25; J. T. Shutt, Swan Hotel, Harrogate, 50.

CLARENCE POTTERIES COMPANY (Limited).—Capital 25,000l., in 100 shares. To acquire the Clarence Pottery Works at Norton, near Stockton-on-Tees. The subscribers (who take one share each) are—J. Eddy, Stockton; J. McKenlay, South Stockton; J. J. Smith, Middlesborough; John Barker, Stockton; James McKenlay, Stockton; Peter Graham, Stockton; H. C. Watson, Stockton.

NAVAL AND MILITARY CO-OPERATIVE SOCIETY (Limited).—Capital 50,000l., in 100 shares. To carry on the business of a general co-operative store. The subscribers (who take 25 shares each) are—H. C. Daubney, Elvaston place, 8, W.; W. J. S. Pullen, Shepherd's Bush; J. T. Grant, 18, Callingham place; J. Ward, Junior Carlton Club; J. S. George, Cornwall Gardens; J. M. Jackson, Apsley road, St. John's Wood; W. H. De Carteret, John's Hill, Clapham Junction. **ABRAHAM BRIERLEY AND SONS (Limited).**—Capital 100,000l., in 100 shares. This is a conversion of the business of Messrs. Abraham Briery and Son, of Rochdale, cotton spinners. The subscribers are—James Briery, Rochdale, 180; John Briery, Rochdale, 310; P. Briery, Rochdale, 310; T. Briery, Rochdale, 134; J. W. Briery, Rochdale, 130; C. E. Briery, Rochdale, 130; Abraham Briery, Rochdale, 134; J. C. Briery, Rochdale, 134.

ANGLO-PARAGUAYAN BANK (Limited).—Capital 100,000l., in 100 shares. To establish a bank in Paraguay and elsewhere. The subscribers (who take one share each) are—A. F. Ballie, 17, Palace Gate terrace, W.; W. A. Hicks, 6, Stan-houpe terrace, G.; Herring, 6 Park crescent, N.W.; G. Herring, jun., 16, West-bourne street, Hyde Park; J. P. Leith, 7, Albemarle street; J. G. Rouquette, 35, Finabury-circus; L. Tompkins, 26, Buckland-crescent, N.W.

QUEEN ANNE'S MANOR COMPANY (Limited).—Capital 200,000l., in 100 shares. To acquire existing buildings or land for the purpose of erecting manor-houses according to agreement made with Mr. Hankey. The subscribers (who take ten shares each) are—F. P. Quin, M.D.; Cecil Guinness, 40, Cadogan place; M. Low, Roland Gardens, S.W.; C. F. O. Simmons, 151, Westbourne terrace; A. Gardner Hastings, Doctor's Commons; A. R. Blain, 7, Hyde Park Gate; E. W. Bushby, 3, South Faxon place.

HAY'S WATERPROOF GLUE AND NEW PATENT ENAMEL COMPOSITION AND VARNISH COMPANY (Limited).—Capital 20,000l., in 50 shares. To acquire the business of the Patent Waterproof Glue Company (Limited). The subscribers (who take one share each) are—T. W. Miller, Cosham Park, Southampton; W. Dummer, Elm Grove, Southsea; G. W. S. Iago, Cheyne Walk, S.W.; G. C. Prior, 15, High street, Portsmouth; W. Stokes, Lardport; W. P. Ford, Southsea.

ORIENT STEAM NAVIGATION COMPANY (Limited).—Capital 500,000l., in 100 shares. To carry on the general business of a steamship company. The subscribers (who take one share each) are—James Anderson, 1, Blitler court; T. Green, 112, Fenchurch street; J. G. S. Anderson, 1, Blitler court; A. G. Kettlewell, 112, Fenchurch street; W. R. Andrews, 1, Blitler court.

JOHN SON AND COMPANY (Limited).—Capital 50,000l., in 50 shares. To acquire a brewery at Canterbury. The subscribers are—Thomas Hood, Dorking, 50; John Grove, Hampton, 100; J. G. Johnson, Southwood-croft, Highgate, 100; H. S. Foster, 27, St. James' street, W.C.; J. O. Johnson, Canterbury, 1000; C. Hight, 67, Chesapeake; J. C. Cooper, Hyde, near Hendon, 5.

CANTERBURY AGRICULTURAL HALL COMPANY (Limited).—Capital 25,000l., in 100 shares. To erect an agricultural hall at Canterbury.

READ'S MARBLE COMPANY (Limited).—Capital 200,000l., in 50 shares. To carry on the manufacture and sale of marble.

KING HENRY STREAM LAUNDRY COMPANY (Limited).—Capital 4000l., in 100 shares. To acquire a laundry at Ball's Pond.

BATH COLLEGE COMPANY (Limited).—Capital 20,000l., in 200 shares. To establish a college at Bath.

Mining Correspondence.

BRITISH MINES.

ABERDAUNANT.—S. Toy, Feb. 14: The cross-cut at the 15 is now driven north towards the lode 8 fms. 4 ft. We have to-day met with a branch about 3 in. wide, underlying south in the same direction as the lode is underlying. The ground is getting very wet, and I am expecting we shall intersect the lode soon.

BERFORD UNITED.—R. Goldworthy, Wm. Phillips, Feb. 14: Driving is continued by the side of the lode in the 132 east, consequently no lode has been taken down since last report. The lode in the winze sinking in the 127 east still maintains its former value, 9s. per fathom, and looking promising for further improvement. The stopes and pitches are producing the usual quantity of ore. We sampled for sale on the 21st inst. 120 tons of copper ore.

BETWS Y COED.—H. T. Huley, Feb. 11: The lode in the shaft is producing a little more lead than last week, and letting out more water, which is a good indication. We are preparing a larger lift of pumps to replace the small one at present in the shaft. The 20 fully maintains its value. There is no change in any of the other points.

BODIDRIS.—H. Hotchkiss, Feb. 13: The 60 yard level cross-cut, driving south to intersect the Maes-y-pwll lode, is re-set at 7½. 15s. per fathom. The ground shows signs of becoming easier for driving, with the same favourable indications of nearing the lode. From my diallings I find we are keeping our point nicely, and are fast approaching the surface line of the lode. The 45 yard level to drive east on middle lode is re-set at 8½. 10s. per fathom; no change to notice in this drive. The winze below this level is sinking in a good lode, and is re-set at 9½. 10s. per fathom. The cross-cut driving north towards Craigroig lode is re-set at 10½. 10s. per fathom. The lode in the rise in the back of the 45 maintains its value, and is turning out excellent lead and blende.

CENTRAL FOXDALE.—W. Harris, Feb. 9: I beg to hand you the setting report for February, by which you will note that the prospects of the mine are no worse than last month, although not yielding sufficient ore to pay our way. It would please me much were it so. We purpose sampling this day week 60 tons. I should be better satisfied had it been 70 tons, but cannot yet manage that quantity. The principal pitch in the back of the 90 has not yet yielded the quantity it did two months ago, which is a drawback, but at present prospects are more encouraging. I will send you the particulars asked for as to the saw bench in a post or two.

INGRIT. The engine shaft is sinking below the 105 as per contract made in October last; present depth about 7 fms.; the ground is favourable for progress, and the water easily kept with the pumps. The 105 east, to four men, at 6½. per fathom; the portion of lode carried is producing stones of lead ore. This level to drive west, by four men, at 8½. per fathom; the lode is worth 1½ ton of lead, and very promising; a large stream of water issues from the forebreast, which makes it very troublesome, but it is considered a favourable indication of a large lode ahead. The 90 to drive east on course of lode, by four men, at 10½. per fathom; the lode produces ½ ton of lead ore per fathom, and is encouraging in prospects. A winze to sink below this level, at 11½. per fathom; the lode yields a little lead ore, but no value; present depth 3 fms. 2 ft. 6 in. The 75 to drive east, by four men, at 1½. per fathom; the lode producing 10 cwt. lead ore per fathom. Taylor's Shaft: The 74 to drive east, by six men, at 5½. 5s. per fathom; the lode yields stones of ore, and promising. This level to drive east on caunter lode, by four men, at 4½. per fathom and 5½. per ton. A new cross-cut to drive north at this level, with a view to intersect the north lode, which I consider a most important object, and in about 23 fms. to cut the lode; set to four men, at 5½. per fathom. We have commenced to drain the water from the surface trials near the office, for the purpose of operating therein if possible. A tribute pitch in back of the 90, on caunter lode, by eight men, at 3½. 10s. per ton. A pitch in back of this level, on main lode, by four men, at 5½. per ton. A pitch in back of the 69, by four men, at 9½. per ton. Taylor's pitch in back of the 69, on south lode, by four men, at 9½. per ton. A pitch in back of this level east, on caunter lode, by four men, at 8½. per ton. A pitch in back of the 55, on south lode, by four men, at 8½. per ton. A pitch in back of this level, on caunter lode, by two men, at 9½. per ton. Machinery and all surface work in fair condition, and making good progress.

COMBARIEN.—John Comer, Feb. 14: In the 28, driving west of cross-cut from Harris's shaft, the lode is improving, producing good stones of silver lead and blende. In the 15, driving east of Harris's shaft, as we get away from the cross-cut the lode is improving, and we look for an early improvement in each of these lodes. Fair progress is being made in driving the cross-cut adit, which is extended 21 fathoms through very conglutinated ground, for the production of mineral. In the present and the ground is of a tough blue kila, with fine strings of lead and blende, and as we now drive further into hill the ground rises considerably, so that when we intersect the next lode we shall have considerable backs. A discovery of silver-lead at this point would be of great importance to the mine.

CWMYSTWTH.—Feb. 13: In Gill's upper level driving east the lode is large, containing a little lead and blende ore, but not enough to value. We have about 9 fms. more to drive to reach the eastern of shoot of ore gone down in the bottom of Mitchell's level; here a winze should be commenced at once, to be down to Gill's level by the time the end reaches that point, to hasten the opening of the shoot. The 105 to drive east, on the back of Gill's upper level on new lode still looking well, lode worth fully 1½ ton of lead ore per fathom. We have not done much here in the past week, as the men have been engaged putting in a stull in the back of the level. In the stope in the 12 over Mitchell's level, on the new lode, is 18 in. wide, producing 15 cwt. of lead ore per fathom. In the stope in the back of Mitchell's level west, on the new lode, the lode is 2 ft. wide, worth 12 cwt. of lead ore per fathom. In the stope in the back of the intermediate level, on the new lode, the lode is 2 ft. wide, worth 12 cwt. of lead ore per fathom; this stope appears to be shortening as it goes up. In the stope over the level Fawr, on the copper lode, the lode is 12 ft. wide, worth 10 cwt. of lead ore per fathom. The men here are now engaged in breaking ground, which we think will leave a profit. In Mitchell's cross-cut driving north by rock drill the ground continues just the same, rather jointy and short for cutting, water still issuing from the end, which would lead us to expect that a lode or branch is not far off. The pitch in the back of Row's level is suspended, and will not pay for working; the men are now engaged clearing their stuff. The other three pitches are producing on an average 14 cwt. of lead ore per fathom, and the men getting fair wages. All the dressing machinery is in fair working order, and the weather moderately favourable for dressing and surface work: 14 tons of lead ore have been weighed into the bin during the last fortnight. The 35 tons of lead ore sold on the 11th inst. realised 10s. 14s. 6d. per ton.

DE BROKE.—J. Phillips, Feb. 13: The lode at Wilson's shaft, sinking below the 45, so far as opened this week, has rather improved, producing fine stones of lead and copper ores, and blende. In the 45 east the lode is 5 ft. wide; it is at present disturbed by a cross-joint, and merely yields good spots of ore, but is wet and promising. There is no change in the 45, driving west. The 35 east still looks encouraging. We are opening out a wide lode with branches and rich patches of lead ore of stopping value intermixed throughout. As to the stopes generally, there is no definable change in their appearance or yield since last week's report. Drawing and dressing for the next sampling are in progress, and I expect to have 20 tons by the next annual trial.

D'ERESBY MOUNTAIN.—Wm. Bennetts, Feb. 13: The lode in No. 3 adit end is still fully 1 ton of lead to the fathom and a good mixture of blende—a splendid-looking lode. In No. 4 the large Gorse lode is still looking well, never looked better than it does to-day. In No. 5 adit level I am glad to say we are now making much better progress in clearing. Saturday next being setting day a full report shall be sent you next week.

DEVON GREAT CONSOLS.—Isaac Richards, Feb. 14: Wheel Emma: New Shaft, New South Lode: In the 190 east the lode is 5 to 6 ft. wide, composed of very fine capel, quartz, mundle, and copper ore, and is a good lode for a pit, the men are now engaged driving the 190 west, where the lode is of large size, 8 ft. wide, 6 ft. of which being carried is composed of very fine capel, quartz, mundle, and copper ore, worth 5 tons or 15s. per fathom. In the 175 west the lode is 3 ft. wide, composed of capel, quartz, mundle, and copper ore, worth 3 tons or 9s. per fathom. In the 175 east a communication has been effected between this point and the 175 west of Gorrell's winze, which has secured good ventilation in this part of the mines. The men are now engaged taking down a portion of the lode left standing at the bottom of Gorrell's winze, preparatory to driving east from that point. In the 160 east, the lode is 3 ft. wide, composed of capel, quartz, mundle, and a little good quality copper ore. In Hogge's winze, in the bottom of the 160 east, the lode—4½ ft. being carried—is composed of capel, quartz, mundle, and saving work of copper ore. In Floyd's winze, in the bottom of the 160 west, the ground continues favourable for sinking. In the 100 east, on the north part of the lode, the lode is 3 ft. wide, composed of capel, quartz, mundle, and a little copper ore. In the 100 east, on the south part of the lode, the lode is 5 ft. wide, composed of capel, quartz, mundle, and copper ore, worth 10s. per fathom.

EAST CRAVEN MOOR.—D. Williams, Feb. 14: In the 56, west from shaft, the ground is a little easier to work, and better progress is being made. The vein in the forebreast is 3 ft. wide, carrying a small quantity of lead ore, being saving work for dressing. In the 42 west, to get under the new shaft from surface, the vein is nipped; and, judging from the level above, we shall have about 14 fms. of a knotty piece of hard ground before reaching the ore bearing ground going down from surface. In the cross-cut south in the eastern part of the mine, upon the cross-vein, the latter is 3 ft. wide, and producing good leadstuff for dressing. We have also just intersected a drier off an east and west vein, which is 3 in. wide, and highly charged with lead ore.

EAST DARREN.—Feb. 13: The 80, east of cross-cut, has been extended during the month 2 fms. 2 ft. In a lode 2 ft. wide, yielding 1 ton of lead ore per fm., and looking promising for improvement. The 80, west of cross-cut, has been driven 2 fms. 1 ft. 9 in. in a lode 3 ft. wide, yielding 15 cwt. of lead ore per fm.; the present end has been disordered, and almost became valueless, but is again improving. The winze sinking under the 80 is down 2 fms., and lode little improved—now yielding 15 cwt. of lead ore per fathom. The winze sinking under the 68 is down 3 fms. 3 ft., and the lode is soft and poor. The tribute pitches throughout the mine (three in number) will yield on an average 18 cwt. of lead ore per fm. Our machinery is in good working order. Drawing and dressing progressing satisfactorily.

ELGAR.—James G. Green, Feb. 14: I am glad to say we had a hole through from the rise to the winze to-day. We shall now proceed to square the same down and clean the stuff. Afterwards we shall commence driving east on the course of the lode with a full party of men, where I expect good results.

FRANK MILLS.—J. Rowe, N. Addams, Feb. 13: Setting Report: The rise in the back of the 100, north of engine-shaft, on west lode, by six men, at 5½. 10s. per fathom; lode producing good stones of lead. To sink a winze in the bottom of the 84, north of engine-shaft, on west lode, by four men, at 5½. 15s. per fathom; we expect to make the communication in about three weeks. To sink a winze in the bottom of the 72, north of engine-shaft, on west lode, by two men, at 3½. 15s. per fathom; lode producing 8 cwt. of lead ore per fathom, and looking very promising for soon improving. A tribute pitch in the bottom of the 100, north of engine-shaft, on east lode, by two men, at 4½. per ton for lead ore. A tribute pitch in the back of the 45, north of Orchard adit-shaft, on east branches, by two men, at 4½. 10s. per ton for lead ore. Three tribute pitches are being worked in the back of the adit level at Exmouth Mine, by six men, at 4½. per ton for lead ore. Good progress is being made in erecting the new machinery for treating the halvans, and shall be ready to commence operations on the same in about a fortnight. The result of the present treating of the halvans by the old crusher is very satisfactory, and fully up to our expectations.

GAWTON COPPER.—G. Rowe, G. Rowe, jun., Feb. 9: The new south lode in the 52 cross-cut is laid open 6 ft. wide, without any appearance of the south wall. So far as seen, this lode is composed of hard capel, mixed with spar, mundle, and good quality yellow copper ore, altogether of a very kindly appearance. The lode in the winze sinking below the 105 east is carried 6 ft. wide, producing mundle

and ore to the value of 25s. per fathom. The lode in the 117 east is improving in size and character, being 6 ft. wide, producing mundle and good stones of ore. The tribute department is without change.

GLENROY.—R. Rowe, Feb. 12: The shaftmen will have the ledge out, and be ready to resume sinking the shaft below the 80 by Monday next. The two men proving the north-east course between the 25 and 40 are breaking some good stuff for lead and blende.

GOGINAN AND LEVEL NEWYDD.—Feb. 13: In the past month the 130, east of western shaft, has been driven 1 fm. 4 ft. on a large lode, producing saving work. Here we have cut in north 4 ft., but we are not through the lode as yet, and we hope there is still a better portion standing further north. The winze below the 120 has been sunk 2 fms. 1 ft. 6 in., in a lode producing 10 to 12 cwt. of ore per fathom; the ground is harder than of late, and an improvement may be expected. In the pitch over the 130, east and west of western shaft, the lode is yielding 10 cwt. of ore per fathom. In the pitch over the 120, 35 fms. west of Bryn Pica shaft, the lode yields from 8 to 9 cwt. of ore per fathom; and in the pitch over the same level, 65 fms. west of Bryn Pica shaft, the lode is yielding about the same quantity of ore per fathom. The lode in the pitch over the 120, 12 fms. west of western shaft, is producing 10 cwt. of ore per fathom. The three pitches over the 100, on side branches, are worth from 10 to 12 cwt. of ore per fathom. The drawing, dressing, &c., going on regularly. The machinery is in good working order, and fair progress is being made towards another sampling.

GREAT DILLIFE.—E. Evans, Feb. 13: Dyllife Lode: At the 132 we have 14 men stopping at 3½. 6s. per fathom; worth on an average about 12 cwt. per fm. Over the 95 east we have 12 men stopping at 3½. 10s. per fathom; worth about 1 ton per fathom. Over same level we have eight men stopping at 3½. 17s. 6d. per fm.; worth 18 cwt. per fm. Under the 75 east we have two men stopping at 2½. 10s. per fathom, and 30s. per ton; worth about 15 cwt. per fathom. Under the 40 east we have eight men stopping at 50s. per fathom, and 30s. per ton, worth about 15 cwt. per fathom, and raising water and stuff; worth about 12 cwt. per fathom. Above the 35 we have four men stopping—two men at 30s. per fathom and 30s. per ton, and two men at 45s. per fathom and 30s. per ton; worth about 15 cwt. per fathom. At the 20 we have two men stripping the lode near the shaft at 80s. per fathom; we shall be able to value this next week. In the drivings on the new lode in bottom of winze we have had a very nice bunch of ore this week; the lode appears to be of a bunchy character, as is often the case in ground at this depth, and is set to six men at 6½. per fathom and 30s. per fathom for raising stuff and water. In the upper adit we have two men driving a cross-cut north in search of the Llewellyn lode, at the west of its junction with the Esgring lode, at 3½. 10s. per fathom. Llewellyn lode: Above the 105 east a stop is set to four men, at 3½. per fathom; worth about 18 cwt. per fathom. Over the 95 east four men are stopping at 3½. 7s. 6d. per fathom; worth about 12 cwt. per fathom. Over the same level we have four men stopping at 40s. per fathom, and 30s. per ton; worth about 12 cwt. per fathom. Above the 85 west a stop is set to four men, at 32s. 6d. per fathom, and 30s. per ton; worth about 16 cwt. per fathom. Under the 75 east we have a stop set to four men at 30s. per fathom and 30s. per ton; worth about 25 cwt. per fathom. Above the 75 east we have two men stopping at 45s. per fathom and 30s. per ton; worth about 10 cwt. per fathom. Above the 75, west of shaft, we have a stop set to four men at 42s. per fathom and 30s. per ton; worth about 15 cwt. per fathom. Over the 65 east two men are stopping at 3½. per fathom; worth about 12 cwt. per fathom. At the 35, Bradford shaft, we have two men cross-cutting the lode at 5½. per fathom; this cross-cut is in the lode, but not yet through it; it is a strong lode, and there is a string of blende 4 in. wide; we have not seen any lead in it yet. Above the 95, west of Bradford shaft, we have six men stopping at 45s. per fathom and 30s. per ton; worth about 12 cwt. per fathom. In the same level we have two men stopping at 3½. 5s. per fathom; we shall value this in a week or two. Under the 95 east we have 12 men stopping at 3½. per fathom; worth about 12 cwt. per fathom. At the Bradford shaft, we have six men driving in the lode by six men, at 5½. per fathom; worth about 18 cwt. per fathom. At the 115 we have two men timbering and clearing at 3s. per ft. And at the 15, east of Llewellyn duff shaft, we have two men doing the same on the same terms. There are three pitches set on tribute to 12 men as follows—10 men at 6½. per ton, and two men at 7½. 10s. per ton.

GREAT LAXEY.—F. Reddcliffe, Feb. 12: Deep Mine: In cross-cutting the lode in the 235, south of engine-shaft, there is nothing seen as yet of value. The lode in the Welsh shaft sinking below the 235 continues 4 ft. wide, of good appearance, and producing stones of ore occasionally. The 235 north is without material change, producing 25s. to 30s. per fathom for the part of lode carried in driving, but there seems to be more lode of good value standing. There is no improvement in the 220 and north. The lode in the winze sinking in the 210 is at present closed up very small and poor, but this is, we think, only a nip, and we expect it to open out again quickly. There is not much change in the stopes in this part of the mine, but on the whole they are a little more productive for blende. Dumbell's: The shaft continues to be sunk in the rock, the lode not having yet turned back into it. There is no improvement in the 200 and north. The 185 east is of an average value of 25s. per fathom. The winze in the 170 north is worth 25s. per fathom. We have resumed driving the 165 north, where at present the lode is of no value for ore. Blende, producing 25s. to 30s. per fathom, it is having reaction in point, where there is but little ground between it and the stopes in the roof of the 145 deep mine. In the 140 and north the lode has not all been taken down for the present, but it contains ore, and is promising in appearance. The winze sinking near this end is rather poor at present, value 10s. per fathom. In the 125 cross-cut we have recently passed through what must be considered a lode, or branch of lode, although it consists only of two walls about 2 ft. apart, with vein rock between them. We have since driven about 4 ft. in what seemed the clean country rock, and another parallel joint or wall is to be seen to-day, and it may be that there is something of importance close at hand. The rise in the roof of the 110 north is worth 35s. per fathom. There is no other change in this part of the mine worthy of remark. Good progress is now being made with the sinking of Dumbell's shaft from surface, and we fully expect it will be holed in four months from the present time.

HINGTON DOWN CONSOLS.—T. Richards, Feb. 14: Bailey's Shaft: In the 172 east the indications for a large course of ore are still holding good, and the lode of large size, the part being carried is 5 ft. wide, and is worth 20s. per fathom. In the 160, west of Nicholl's winze, the part of the lode carried is 3 ft. wide, of a very promising character, worth 4 tons of ore, or 12s. per fathom. There is no material change in any other part of the mine.

HOLDSWORTH.—H. Bennett, Feb. 14: The end, driving south on the lead lode, is presenting a most promising appearance. I hope soon we shall meet with a good improvement for lead. In the 60 west the lode is very kindly, with good stones of mundle and copper ore. All our other points remain without change since 1st report.

KINVESTON CONSOLS.—W. Hancock, J. Chynoweth, Feb. 12: We have set the engine-shaft to sink below the 40, by six men, 9 ft., cut top and tip plat, put in penthouse, &c. per contract of 50s., and have put four men to strip down the north part of the lode in this level west at 40s. per fathom;

SOUTH DARREN.—H. James, A. Gundry, Feb. 14: Just up from underground. The lode in the shaft is becoming stronger, intermixed with lead and

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minary work has been done, and 3 ft. sunk below the 45. . . . The many unavoidable hindrances in repairing and changing the pitwork prevented the men driving the 45 west, so that very little has been done there. . . . Five men are working the back of the 45, west of the hauling shaft, at 45, in 17. These men raised about 70 tons of 20 per cent ore from this pitch in October and November months, besides about 10 tons of 9 per cent ore. Four men are employed stopping at the ore from the bunch in the back of the 45, east of the hauling shaft, on conditions that make it equal to 45, in 17. Two others are working at 105, in 17.

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equivalent; and the ends of such chamber or hollow receptacle are to be formed or secured by annular dies or other shaped pieces, so secured to the walls of the hollow receptacles that when completed and charged the explosive material shall not fall out; or other convenient modes of securing the ends may be employed, but in all cases so arranged that the fuse or fuses pass easily, and so a hollow cartridge be formed ready for stringing on a fuse or fuses.

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The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, FEB. 15, 1878.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, common, Clyde.	2 11 1/2	10 0	English, ingot, f.o.b.	67 0	—
" Scotch, all No. 1	2 12 6	10 0	" bars	68 0	—
Bars, Welsh, f.o.b. Wales	5 0	10 0	" refined	70 0	—
" in London	5 15 0	10 0	Australian	63	0-67 0
" Stafford	7 0	10 0	Banca	66	0-67 0
" in Tyne, Tees	7 0	10 0	Straits	63	0-67 0
Swedish, London	9 15 0	10 0			
" in Wales, at works	5 0	10 0			
Sheet, Stafford	8 15 0	10 0			
Plate, ship, in London	7 0	10 0			
Hoops, Stafford	7 15 0	10 0			
Nail rods, Stafford, in Lon.	6 10 0	7 0			
STEEL.					
English, spring	14 0	19 0			
" cast	35 0	45 0			
Swedish, keg	16 0	—			
" fag. ham.	17 0	—			
LEAD.					
English, pig, common	18 7	18 10 0			
" L.B.	18 15	—			
" W.B.	19 10	—			
" sheet and bar	19 10	—			
" pipe	20 10	—			
" red	22 5	22 10 0			
" white	27 5	28 10 0			
" patent shot	23 10	—			
Spanish	18 10	18 5 0			
NICKEL.					
Metal, per cwt.	18 0	20 0			
Ore, 10 per cent. per ton	24 0	25 0			
QUICKSILVER.					
Flasks of 75 lbs. ware	7 5	—			
SPELTRE.					
Bliesian	18 15 0	18 17 6			
English, Swansea	21 0	—			
Sheet zinc	22 0	23 10 0			

* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; 12s. 6d. per box more than 10 quoted above, and add 6s. for each X. Turn-plates 2s. per box below tin-plates of similar brands.

REMARKS.—The disquieting rumours that have been in general circulation have completely deadened our markets, and the amount of business reported has been extremely limited. The Indian demand has considerably fallen off, and the export trade generally will doubtless remain in abeyance until the question of peace or war is decided; but taking the most sanguine view, and supposing England does not engage in war, still there are so many difficulties to overcome that a great deal of time will necessarily be lost in discussing and effecting a final settlement of the various questions, and in the meantime we may prepare against receding many scares. On the other hand, should war be declared by England, then it is not unlikely—indeed, it is most probable—that our markets would at least temporarily be thrown into the greatest confusion. Alarm would create panic, and undoubtedly cause a fall in the prices of certain metals; therefore, whether our country goes to war or not our markets for some time to come will be kept in a most sensitive and feverish state, and sudden and frequent fluctuations may be looked for. Business men have had ample warning of coming events, and it will be entirely their own fault if they neglect the proper means of security. Lethargy or adventurism at the present critical juncture would be equally culpable; neither must there be hesitation, for that would be fatal. Decision and prompt action are what the present occasion demands.

It is an exceedingly painful admission to have to make, but we must confess that we do not see the slightest chance of improvement in trade during the first quarter of the year, and with the certainty of increased taxation to pay off the six millions, the future prospects are anything but promising. The Government is evidently getting more embroiled in foreign affairs, and the country is beginning to wish that the delicate and timid Lord Derby would give place to the resolute Lord Salisbury, who would probably be better able to grapple with the momentous subject of the day. Lord Derby, however, has stated that we are not prepared to see Constantinople pass into other hands than that of Turkey, and that the crisis is not over—far from it; but since the conditions of our neutrality was made known the subversion of the Ottoman power has taken place, and it now exists only in name, and Constantinople is entirely under the power of the Russians. Now, it is clear enough that the limits of our neutrality have been reached, and we are anxious to learn what measures are intended to be taken to require Russia to respect our declaration, or are we going to quietly submit to the affront, and become the laughing-stock of all Europe, simply because there is a peace-at-any-price party amongst us. Would that be the way to maintain our rights for the future? Certainly not, and we intend to assert our rights by force if needs be, and show Russia that Great Britain is not to be trifled with or imposed upon. We simply want a plain and straightforward answer. Will Russia prefer to retire from Constantinople, or enter into a war with England?

A want of resolution in our statesmen at the present time would really be lamentable and inexcusable, and much as we regret to see that the prospects of war are daily increasing, yet our position must not be compromised by any feeling of fear or dread of the consequences of war, for a firm and bold front now may save us from much greater sacrifices hereafter. To leave Russia where she now is would be to have an autocrat dictator to all Europe, yet what does the Russian Press say upon the subject—that Russia will show by her attitude she does not mean to yield on any essential point of her programme. That being the case, what chance is there of peace ensuing? Will Austria acquiesce, and allow herself to be deprived of the Danube, or will she not, jointly with Great Britain, protest against this and the other arbitrary and monstrous terms of the Russian programme? But Russia has gained possession, and will fortify herself on Turkish soil, and nothing but force will avail to turn her out again. Moral persuasion will have very little influence. Constantinople has always been Russia's ambition, and it will be no easy matter to compel her to surrender it. What, then, is to be done under the circumstances? A passive or an observant attitude will not improve matters, for actual war would be better than the existing tension, and yet there seems no alternative but war if Russia will not desist from her aggressive policy and modify her terms. France and Italy seem to be wholly taken up and somewhat excited over the election of the new Pope of Rome. It is to be hoped that the choice will give general satisfaction to both nations and to the Catholic communities at large. Religious affairs ought to be disconnected from the State, and for the future peace of Italy it would be as well now to restore the Vatican to the King. Commercial affairs continue to be seriously damaged by the turmoil of religious and political affairs, and it behoves everyone to be extremely cautious and careful in all their operations. It is even to be feared that the market for metals is becoming a little more safe and comfortable position. By minimising risks a panic may be avoided, and dealers may be saved from the necessity of effecting forced sales on a bad market at an enormous sacrifice. The statistical position of all metals is unfavourable, for stocks are large and accumulating, and trade is still declining, and with the prospect of serious political complications, and the withdrawal of large sums of money from the Bank of England, there may possibly arise financial difficulties, and it is better under such circumstances to be free from money obligations.

COPPER.—Scarcely any alteration has occurred this week, and sellers still adhere closely to former rates. As long as they continue to adopt this course there will be very little chance of buying cheaply, and buyers must submit for a time to purchase their requirements at the prices demanded. It is unsatisfactory to have to pay more than the proper value, but since the stock is so well held, and in such few hands, buyers have no alternative, and must pay for their copper. How long it will answer the purpose of holders to maintain the rates remains to be seen, but at the beginning of the month stocks had increased, and were larger than for some time past; and the last charter being 2900 tons for the last half of January, showed no falling off in the supplies from Chili. The particulars of the telegram are as follow:—500 tons bars and ingots, and 900 tons fine ore and regulus for the United Kingdom, and 500 tons bars for the Continent. Australian copper shows but little variation in price, and the next public sale of Wallaroo is fixed for Tuesday the 19th inst., when 500 tons of cake and 144 tons of ingots will be brought forward. There will be no public sale of Banca this time, and, therefore, the Wallaroo may have a better chance of sale; the market does not appear to have been "beared" so much as on previous occasions, which is a sign that dealers do not anticipate much lower prices, and it is not improbable that the whole sale may realise 75s. to 76s.; but there is no certainty about public sales, especially at this perilous period. Chillan ores have realised 12s. 7½d. per unit, and Cape ores 12s. 10½d. By the mail from New York on the 3rd ultimo that market was reported quiet but steady for manufactured and yellow metal, and there was rather more enquiry for ingots, and with stocks offered less freely, the market closed stronger. The sales embraced 150,000 lbs. to 200,000 lbs. Lake at 17½ to 17½. The advices from India bring slightly lower prices, and but few orders. The orders given out last month will probably supply the market for some time, and unless lower rates are taken there is not much chance of obtaining further orders. The smelters would willingly sell cheaper if they could buy the Chili bars and furnace stuff cheaper, and it is rather annoying to know that the time for execution of orders is expiring, and that they will have to be returned for higher limits when there is every probability of their not being renewed only at lower rates.

IRON.—Our market continues in a very sluggish state, and the whole trade exhibits symptoms of decay. There is not a single feature upon which to dwell that affords satisfaction. The amount of business

transacted is extremely limited, and mostly at unremunerative prices. Sellers are suffering immensely from the loss of patronage, and all those who work under them have to submit to a large share of the burden of misfortune that has overtaken this particular branch of business; but a good many orders that go elsewhere for execution might be secured for our own works by making further concessions, especially those for common qualities, which would be so essential at the present time to the Welsh and Middlesbrough districts. It may, perhaps, be thought unreasonable to advocate lower prices when current rates are already unremunerative, and in many instances absolutely ruinous, and we quite agree and think it would be a very harsh and unjust request upon sellers to expect them to increase their loss without others who are in connection with them and nearly as much interested in the welfare of the trade, also bearing their fair proportion; but it is very certain that unless one and all are prepared to work hard for very little returns there will be a complete sacrifice of the whole. If there were no orders to be had we might advocate a different case, but while daily importations of considerable quantities of Belgian iron take place, it is evident that more trade could be obtained under different arrangements. If Belgium can make the iron, incur all the expenses of freight, insurance, and shipping, and yet deliver in our port cheaper than English makes can be bought at, clearly there must be something wrong here, for no country ought to be able to place coal and ironstone in the market cheaper than England. Wages and profits must all be cut down, and everything must work cheaper than before, for while we are idle and starving Belgium is reported to be very active. This reflects great discredit on the managers of the iron trade that such a state of things should exist.

In the beginning of the week a Conference was held in Bristol, to consider the deplorable state of trade. Dr. Percival, of Clifton College, took the chair, and expressed a hope that the meeting would be the means of averting the danger of workmen and employers dividing themselves into opposing camps instead of considering their interests as mutual. We full endorse his remarks, for it is the fiction of interests that has caused all the mischief, and where it still lies, but there are none so blind as won't see. To everybody it has been patent that the interests of masters and men are identical, yet neither the one side or the other have ever seemed inclined to admit it, and they run counter to one another; the result is that both parties suffer from each other's obstinacy and self-will, and which generates a bad feeling, and separates them wider than ever. Necessity is a hard task-master, but a little wholesome chastisement may be extremely beneficial, and if it be rightly timed it may prove of great advantage hereafter, but if we would improve by correction there must be nothing smothered or concealed. It was stated that in 1874 the Merthyr district employed about 8000 miners, and scarcely 1000 were now employed, and a large proportion of these only for two or three days a week. Emigration was suggested as the best means of relief. Various causes were assigned for the distress, some attributed it to the land laws, and others to drunkenness; the latter Mr. Macdonald indignantly denied, but his denial of this evil will have very little weight, for it is proverbial that drunkenness and immorality exist to an alarming extent in the iron districts, and it ought to be exposed and not hushed up. An improvident class of men cannot expect to meet with sympathy and relief unless they repent and reform, and we observe no real signs of either the one or the other yet awhile, but we are glad to see that before the meeting separated a resolution was passed to the effect that the establishment of general and comprehensive systems of conciliation in the settlement of trade disputes would lead to the benefit of both employers and employed, and the nation at large. If Mr. Morley and a few others of his stamp could be found to exercise their kind and genial influence, and demonstrate to the men in a plain and intelligible manner that opposition and rebellion are destructive to their interests, and that no business can prosper while such elements of discord remain, they would be conferring a great blessing upon the men and the country at large.

This great dullness in the trade does not confine itself to any one producing district, but to all in the kingdom. One and all are unanimous in their complaints as regards the monotonous condition of the trade. In South Staffordshire only 45 furnaces out of 47 are in blast, so who can wonder at the masters being dissatisfied and disgusted with the trade when such reports reach us as 102 furnaces in merely one district are out of blast. What few transactions have taken place at Birmingham are said to have been done without change in price; masters, however, are showing rather more firmness in their quotations, 6s. to 7s. being quoted for common unbranded bars, and 8s. to 8s. 15s. for sheets. The war news is causing great excitement on the markets, and keeping business in a most dilapidated condition. The Newcastle market remains without change, the colliers and miners are very undecided whether to resume work at the full reduction in wages, or whether to be continuing the strike. We are sorry to note that there are many who prefer this latter course, but it is hoped and believed that there are more who will show their good sense and begin work afresh very shortly. The works are reported to be keeping in a very idle condition at Leeds, the locomotive branch being the only branch fairly employed, but only in the execution of old orders, fresh ones being particularly scarce. It is expected that the Northfield Ironworks will re-open at the beginning of next week, the men having agreed to the reduction of 7½ per cent. in their wages. None of the works in the Rotherham district show anything like activity, very few orders having been given out. The trade has been pretty well at a standstill during the week at South Durham, and the news from the East does not in any way tend to improve the markets, but, on the contrary, plunges them, if possible, in more depressed condition than they have been lately. Although, notwithstanding the reduction in make to a very small extent, yet the returns for pig-iron show an increase in stock by about 44,000 tons. Masters, however, keep their old quotation of No. 1, 45s.; No. 3, 41s.; and No. 4, 40s., less 1 per cent. The demand for ship-plates has been slightly better, but all other branches have been without change. Bessemer iron at Barrow-in-Furness continues in a fairly good demand, chiefly by steelmakers. No. 1 is quoted at 65s., and No. 3 at 62s. 6d. Iron ore is tolerably firm, but stocks remain large. For pig-iron at Middlesbrough there are increased enquiries, but buyers are very reluctant to give 40s. for No. 3, consequently very little iron has been sold, merely enough for immediate requirements. At a public sale of hematite pig-iron 42s. per ton was realised. The Cleveland ironmasters' return for last January shows a decrease of 709 tons in the make of pig-iron on the previous month, and nine furnaces less in blast than in the corresponding month last year, and an increase by 27,563 tons in makers' stocks upon last December.

The foreign reports, though better than the home ones, are not altogether satisfactory. The Belgian works, however, keep pretty active, and the demand very good, but the French are feeble, and the consumption of iron very small, and prices show a downward tendency. The American market is dull, with very little business doing. Pig is quoted—No. 1, 31s. to 32s.; No. 2, 28s. to 29s.; and No. 3, 26s. to 27s. Scrap iron, 1s. 10d. to 1s. 11d. wrought 2s. 3d. to 2s. 4d. per cwt. Rails are in a fair demand, but manufactured is light, and prices remain without change. The unsettled and disquieting position in Eastern Europe has checked business in Scotch pigs in Glasgow very considerably, causing prices at the end of last week to recede from 51s. 6d. cash to 51s. However, at the beginning of the week business showed some improvement, and prices became somewhat firmer again, 51s. 2d. to 51s. 3½d. being the price transactions were carried through for prompt cash, and 51s. 6d. for one month, the present price being 51s. 2d. cash.

For the week ending Feb. 10, 1877..... Tons 6,183
For the week ending Feb. 9, 1878..... 5,837

Decrease..... 546
Total decrease for 1878..... 1510

Imports of Middlesbrough pig-iron into Grangemouth:—

For the week ending Feb. 10, 1877..... Tons 7,331
For the week ending Feb. 9, 1878..... 4,740

Decrease..... 2591
Total decrease for 1878..... 6,386

In blast Feb. 10, 1877..... 113
In blast Feb. 9, 1878..... 88

TIN.—This market keeps in an uncertain state, owing to the continuance of heavy supplies from Australia, and it is utterly impossible to make any reliable calculations concerning the future of this metal. All we can say is that it does not at present assume a very promising appearance; but although the arrivals are large, yet the deliveries are extremely good. Were they to show any falling off the market would undoubtedly decline; but the number of tin-plate makers has so much increased that there is not much fear of a less quantity of tin being required, although the prices of tin-plates are declining, and that may make some difference in the turn-out if the price of the raw material is upheld. Present prices of tin do not check supplies, and according to the rate at which shipments are made to this country it would appear that importers are eager to secure the current market value; that being so, prices should be lowered to check the excess. A temporary reduction in English tin to 60s. for the purpose of testing the Australian production would alarm the mining community of that country, and it is not unlikely might have the desired effect of causing supplies to be sent forward in greater moderation for the future. The reduced prices have taught our miners a lesson to economise labour by using the improved boring-machines. Necessity is the mother of invention. There is no doubt all England is in a state of transition. The primitive system of manual labour cannot compete with modern machinery, and to keep pace with the times we must quietly adapt ourselves to the latest and most approved inventions. Opposition is useless, and anyone who holds old-fashioned ideas will only find that he is gradually going back, and getting farther behind than ever, and will have to abandon his work to others of greater energy and enterprise. Low prices, no doubt, are objectionable to many, and are very hard to bear at certain stages; but they are often a public benefit, and sometimes confer considerable advantages upon those who feared them most. By the mail leaving New York on the 30th ult. we hear that there was general apathy existing, and prices were nominal. The speculative feeling was dormant, and consumers' wants were small.

QUICKSILVER remains at 77. 5s., but hardly any demand exists at this price; the business doing is consequently insignificant, whilst stocks are accumulating.

THE IRON TRADE.—(Griffiths's Weekly Report).—Friday evening. Business was done this morning on the Glasgow Exchange in G.M.B. warrants at 51s. 3d. A good business was done at the morning meeting and again this afternoon, when warrants closed with buyers at 51s. 3½d., about 1d. more than the closing price last Friday. We quote makers No. 1 iron—Gartsherrie, 69s. 6d.; Coltness, 69s.; Calder, 69s.; Langloan, 62s.; Summerlee, 69s.; Monkland, 62s. 6d. f.o.b. Glasgow; Glenanglo, 68s. 6d.; Eglinton, 63s. 6d., f.o.b. Ardrossan; Shotts, 60s., f.o.b. Leith; Kennell, 64s. 6d., f.o.b. Boness. A meeting was held last Tuesday of the Cleveland Ironmasters' Association to discuss the advisability of raising the price of iron 1s. per ton. The decision arrived at was that for the present it was desirable to make no change. It was clearly understood that present rates will be firmly maintained by the Cleveland smelters. Mr. H. O. Firmstone has had a meeting with the men lately engaged at the Hyde Ironworks with the view of re-starting a portion of the works. Mr. Firmstone explained the difficulties in the present juncture of making iron to a profit, and alleged this as his reason for closing the works. The Lowmoor, Bowling, and Kirkstall Forge Ironworks, in Yorkshire, have received considerable orders of late for various specialities, some of which are required promptly by the Government. Additional orders have likewise been received by the Earl of Dudley and other leading Staffordshire ironmasters from the same source. The trade in Staffordshire is certainly in a better position, several of the noted works being better employed than they have been for two months past. The sheet-iron department is well employed, and various specialities

required by the Government are finding work for several of the large ironworks and the foundries of the district. Mr. H. O. Firmstone is about to re-start a portion of the Crookhay and Hyde Ironworks, and Mr. Lysaght has already set in motion a portion of the Swan Garden Ironworks. The complicated state of politics in the East engenders much anxiety in the iron trade, and the general feeling is, that the joint action and disposition of the English and Russian Governments will prevent the outbreak of a general European war.

MESSRS. FRY, JAMES, AND CO.—The Eastern Question continues to occupy the most prominent attention, and its complicated condition checks all prospect of immediate recovery. COPPER has by comparison been in fair demand—just sufficient to keep rates of Chili steady—but English makes are rather easier to buy. A sale by auction of 734 tons of Wallaroo is announced for Feb. 19. IRON is still without change. TIN has lost the improved value noted in our last, and has become flat and slow of sale at the lower quotations. SELLER continues dull, but without change in quotations. LEAD also is in limited demand. TIN-PLATES steady.

MESSRS. VIVIAN, YOUNGER, AND BOND—COPPER: As will be seen by the under-noted figures the position of this article is not improving. The price of Chili bars has been well maintained, but other sorts have been much neglected. Consumers report a slack trade, and the prospect of revival appears to be as remote as ever. In furnace stuff the following sales have taken place by public ticketing at Swansea:—On Jan. 22 2334 tons ore, average produce 6s. 16½d. per unit, average price 11s. 10d. per unit; on Feb. 5 1405 tons ore, average produce 7s. 7½d. per unit, average price 12s. 0½d. There will be no sale on Feb. 19. On Jan. 30, by private tender here, 492 tons Cape ores realised 18s. 0½d. per unit for 32½ per cent. By private treaty about 1000 tons Spanish precipitate have sold at 12s. 6d. to 12s. 10½d. per unit. In Chili furnace stuff 500 tons Peruvian ores, 16 per cent., at 12s. 7½d. per unit, to arrive at Liverpool; 280 tons regulus, spot, Swansea, at 13s. per unit; 500 tons ore, spot, Swansea, at 12s. 9d. per unit. The charters for the first half of January were advised by cable from Valparaiso as equal to 2100 tons fine; those for the second half not being yet known, owing to a break in the cable. According to the Board of Trade Returns for the United Kingdom, the imports and exports of copper during the following years, estimated in fine, were as follows:—

IMPORTS.	1877.	1874.	1875.
Copper in ores and pyrites.....Tons	34,716	24,226	23,046
Do., regulus.....	16,850	13,952	16,283
Do., bars, &c.....	39,743	39,145	39,572

Total..... 91,309..... 77,323..... 77,901

EXPORTS.	1877.	1874.	1875.
Manufactured copper, &c.....Tons	24,949	20,942	23,492
Unmanufactured do.....	11,620	11,708	11,090
Foreign do.....	14,157	17,234	14,859

Total..... 50,726..... 49,884..... 49,271

TIN: The deliveries for last month were so good, especially considering the general state of the metal trade, that our figures are not so unfavourable as might have been expected in view of the large quantity afloat. The present quotations appear to be generally accepted as likely to be about the ruling ones in the existing state of the stocks, supplies, &c. The market gradually gave way during the past month from 65s. for Straits and Australian, until 63s. was touched. At this point buyers came forward, and a fair quantity was taken on speculation and for investment, causing a rally to 64s. The market is again easier, and 63s. 6d., sellers, is the closing quotation, though at 63s. buyers would still go on. English has sold down to 67s. for common ingot. The deliveries of foreign from London warehouses were 1147 tons, exclusive of 440 tons Straits outside to America. At the Banca sale on Jan. 30 15,106 slabs sold at an average of 40s. 3s. fl., or equal to about 68s. 6d. delivered here. The stock of foreign tin in London and Holland is thus estimated:—

Foreign tin in London.....Tons	Feb. 1, 1877.	Feb. 1, 1878.
Banca tin in Holland.....	1,485	1,450
Do. (in Company's hands).....	435	449
Billiton tin in Holland.....	1,318	930

Total..... 11,509..... 10,894..... 9,620

MESSRS. PIXLEY AND ABELL—GOLD: Large orders from the Continent have caused withdrawals from the Bank in bars and coin to the extent of 450,000l.; in addition thereto, the arrivals we mention below have also been purchased, and the demand for export continues good. We have received 29,500l. from the West Indies, and 114,000l. from New Zealand. The Elbe takes 130,850l. to the Brazils. SILVER has been steady, at a slight reduction from our last quotation, and considerable business has been done at prices varying from 54d. to 54½d. The market is slightly weaker to-day, in response to lower exchanges from India. The receipts of this metal during the week have been—31,000l. from New York; 25,000l. from the West Indies; 290,000l. from Germany; total, 346,000l. The P. and O. steamer takes to-day 448,000l. to Bombay.

THE MINING SHARE MARKET is without any change this week, and there is very little general business doing. The settlement of the past fortnightly account has occupied the chief attention of the dealers; and in the present unsettled state of our foreign relations the public stand aloof from mere speculative purchases for the future. For investment a few lead mines are in demand.

TIN MINES remain without change, and quite inactive; the prices, therefore, are nominal. Carn Brea, 39 to 41; Dolcoath, 30 to 32½; Cook's Kitchen, 2½ to 3; South Cornwall, 9 to 9½. South Crofty, 10 to 10½; at the meeting in Cornwall the accounts showed a loss on three months' working of 781l., and a balance against the company of 1799l. The tin sold (40 tons) realised 1264l.; copper, 773l.; arsenic, 323l. A call of 10s. per share was made. The report of the mine is promising, except so far as relates to the price of tin, which reduced the credits of the quarter in comparison with the price at the last meeting from 200l. to 300l. Tincroft, 11 to 12; West Godolphin, 1 to 1½; Wheal Agar, 3½ to 4; Wheal Grenville, 2 to 2½; Wheal Peavor, 6 to 6½; Wheal Uny, 15s. to 20s.; Penstruthal, 4s. to 6s.

COPPER MINES are quiet. Devon Great Consols, 3 to 3½; Bedford United, 2s. 6d. to 5s.; West Tolgu, 7s. to 7½. Parys Mountain, 9s. to 11s.; at the meeting, full particulars of which will be found in another column, the accounts, referred to in our last, were adopted and passed. It was stated to the meeting that some important experiments were going on in regard to the halvans, of which there were many thousands of tons in the mine, and also the poor ores. These experiments were not at the expense of the company, but if successful would be adopted at a small royalty, and of vast importance. Morfa-Du, 10s. to 12s. 6d.; the statutory meeting was held here on Thursday. Sinking for the bluestone was going on expeditiously, and in a few months the directors hope to raise a large quantity, and for which they have every reason to expect a good demand. Hingston Down, 2 to 3; Gawton, 2s. to 4s.

LEAD MINES are most in demand, but prices generally are nominal. Van, 27½ to 30; Great Laxey, 20½ to 21½; Glenroy, 2 to 1; Grogwinion, 3½ to 4; Herodsfoot, 9 to 10; Ladywell, 2 to 1½; Leadhills, 3½ to 4; Llanrwst, 1½ to 1¾. Roman Gravel, 7½ to 8; the sampling of lead is 180 tons for the month. Tankerville, 3½ to 4; Temple, 2½ to 2¾; West Chiverton, 14 to 15; Wye Valley, 1½ to 2; West Wye Valley, 3½ to 4; D'Eresby Mountain, 50 to 60. At Clementina meeting, held on Friday, the accounts, which were passed, showed a balance of assets over liabilities of 241l. 17s. 1d. The directors' report stated that when the company was formed it was thought the small capital raised (2560l.) would be sufficient to purchase the mine and plant and sink the shaft, so as to prove the value in depth of the course of ore which had been so productive in the 25 fathom level. Some months delay, however, had taken place in the summer, caused by the want of water, and a grant of four acres of ground had been acquired, and a reservoir made at some expense, so that for the future there will be no stoppages for want of water. A new lease for the mine has also been obtained, and as the expenditure has been larger than anticipated, and a new wheel and extended dressing-floors will be required, it is recommended that the company, now in 128 shares of 20l., should be made into 2560 shares of 10l. each, and 2560 more created, also of 10l. each, so that the mine would be in 5120 shares of 10l. each. These new shares to be offered to present holders at a deposit of 5s. per share, the rest to be called if and when required. The original shareholders at 20l. each when new leases were obtained sold D'Eresby to the present company, each shareholder who subscribed 20l. per 1-512th share receiving 3-512ths as a bonus. Thus, each original shareholder of 20l. has received a 60l. bonus. The agents are still very sanguine that the mine will become a good profitable dividend paying mine, and will be at once getting into returns. West Pateley Bridge, 2 to 2½. Rookehope, 17s. to 19s.; the sampling here on Saturday will be 30 tons of lead only, owing to severe weather preventing outside operations. The sampling next month is expected to be 50 tons. Red Rock, 2 to 2½; South Cwmystwith, 3 to 4; St. Harmon, 2 to 3; Caron, 2½ to 3; Tyn-y-fon, 1½ to 1¾.

FOREIGN MINES.—Blue Hills, 3 to 3½; Huitfahl, 4½ to 5; Condes of Chili, 2½ to 3. Santa Barbara advices show a profit for the month of December of 284l. 2s. 3d. The gold returned (3238 oits.) is valued at 1376l. Chontales, 10s. 6d. to 12s. 6d.; the advices to hand show a return of 300 ounces of gold for the month, estimated at 797l.; the costs, including 104l. for repairs to the machinery, have been 788l. 15s. 5d.; profits, 8l. 4s. 7d. Javali, 2 to 2½; the gold return for the month is valued at 1350l.; costs, including 13l. on capital account, 907l. Eberhardt and Aurora, 6½ to 8½; Flagstaff, 12s. 6d. to 17s. 6d.;

I.X.L., $\frac{1}{2}$ to $\frac{3}{4}$; New Quebrada, 2 to $2\frac{1}{2}$; Port Phillip, $\frac{1}{2}$ to $\frac{3}{4}$; Richmond, 8 to $8\frac{1}{2}$ ex div.

The Market for Mine Shares on the Stock Exchange has been exceedingly inanimate during the past week, owing to the continuance of the causes which have so long operated to retard an improvement. Mine shares, however, are affected less, perhaps, than many other securities, and the consequence has been that, notwithstanding the absence of demand, prices have shown no appreciable decline.

The question of increased, though not meddling directorial, supervision was energetically raised at the meeting of the Parys Mountain Company, and as the proposition which resulted was received in the best possible spirit by the directors, it may be hoped that great benefit will result to all parties. Strict supervision and control is as necessary as meddling interference is prejudicial, but the latter is not to be anticipated, with respect to Parys Mountain, since the necessities of the case were evidently well understood by the Chairman (Mr. J. Y. Watson), who said that he had had nearly 40 years experience of mines, and had been a good deal underground, but he had never presumed himself to interfere with underground workings when the agents were good practical men, and the directors had full confidence in them. In fact, he knew of no greater curse to mining than the interference with such agents by those who practically knew much less, or nothing, of what was necessary to be done.

All that is required is to make every officer of a mining company—whether he be director, manager, agent, or miner—feel that his retention in office is dependent upon the concern being made remunerative to the general body of shareholders, and that working miners merely to earn officers' salaries is neither advantageous to mining or to the outside capitalists engaged in it. The evils of pluralities with regard to secretariats and managements was pointed out in this column a few weeks since, and the only inference to be drawn from the discussion on Thursday is that pluralities in directorships are equally dangerous, because the fees yield so good a return on the investment that trade profits are of secondary consideration. In the Articles of Association of the Parys Mountain, as well as of many other companies, the power to fix directors' remuneration is taken out of the hands of the shareholders, and the office of director becomes in practice, though not necessarily, the permanent property of the first directors, because the directors being re-eligible immediately upon retirement by rotation the failure to re-elect is regarded almost as an insult. The result is that directors grow apathetic, or at least fall into a groove, which in many cases causes the company to be permanently unprofitable to the shareholders. The Parys Mountain Articles of Association state that there shall be not less than three nor more than five directors, and that they shall receive the sum of 250*l.* per annum between them for their services. Now, 250*l.* per annum is equivalent to interest at 5 per cent. upon an investment of 5000*l.*, so that if the three directors who held office up to Thursday (there were formerly four, and a fourth was also elected at the meeting in question) hold no more than that amount of shares their fees alone secure them good interest for their investment, and their chance of dividends on their 5000*l.* worth of shares is an excellent prospective remuneration for the duties they perform. But the directors' qualification is but 200 shares, equal to 600*l.* at par price, or less than 100*l.* at present market price; and assuming five directors, the 50*l.* fee gives 8*l.*, 6*l.*, 8*l.*, 6*l.*, 8*l.* per annum upon even the 600*l.*, and 50 per cent. per annum on present prices. Who, then, would not be a director? At the meeting, on Thursday, Mr. Bush suggested that out of this handsome remuneration each director should at his own cost visit the mine once in each year, so that one or other director might visit every two or three months. He stated, moreover, that the result of this active directorial supervision an improvement of something like 700*l.* per month had been effected at South Darren—which is now making nearly 50*l.* per month profit—and expressed the opinion that at Parys Mountain and Morfa Du (which since the property was abandoned by Messrs. John Taylor and Sons has never yielded more than directors' and management fees) equally satisfactory financial changes might be brought about. He is to be given the opportunity of making a trial.

The recommencement of the shipments of ore from the celebrated Emma Mine has led to increased interest in the now virtually defunct English company, and hence the "statement of claim" put in in connection with a suit commenced in the Court of Chancery some months since has been re-published as if it were new. The facilities for commencing actions and suits in the English Courts are too well known to need explanation, but it is, perhaps, not so perfectly understood that it is extremely easy for plaintiffs, even where the defendants are blameless, to publish the most annoying and damaging statements under the guise of "statements of claims." The property to work which the (London) Emma Company was formed has long since passed entirely out of all English hands, and the concern has only been kept nominally alive for the purpose of litigation, which may or may not prove remunerative to those who have commenced it. It has frequently been asserted in the *Mining Journal*, and those concerned will do well to remember that according to a well-ascertained principle of law, only certain shareholders have, legally speaking, any voice in the matter. The object sought is to set aside the contract under which the Emma Company purchased the property for 1,000,000*l.*, the ground for such setting aside being fraudulent mis-description. Now, it is the impracticability of proving fraud, or anything like it, that caused somewhat similar proceedings to fail so completely in the United States. The mere sale of threepenny pieces at 20*s.* per dozen would not necessarily constitute fraud, although it might be regarded as presumptive evidence of the commercial incapacity of the purchaser, who would certainly show his wisdom by keeping strict silence and pocketing the loss. Mr. Alex. W. Macdonough, the Chairman of the expiring Emma, asserts that the statement of the company's claim was delivered on Jan. 11, and he is certainly entitled to confidence that his friends should have been so unwise as to publish his *ex parte* details previous to the hearing, since such publication must inevitably create the opinion that the anticipation, it may be well founded, of failure in Court induced the attempt on the part of the plaintiff company to take the law in its own hands, and inflict punishment which the Court itself might not feel justified in inflicting. Happily all such efforts to abuse litigation recoil on those who make them. Messrs. Albert and Maurice Grant naturally complain of the plaintiff's views being circulated without the defendant's relation of them, as has been done by the publication of the statement of claim, but they very properly decline to go into the merits of the case until they are fairly before the Court, although they declare that the defendants have a full answer to every allegation, and anticipate a verdict with costs against the plaintiffs, as was obtained after more than a month's searching investigation before the American Court.

St. John del Rey, 320 to 330; the telegram (delayed in transmission) received to-day dated Rio de Janeiro, Feb. 9, states that the produce for the month of January was 41,500 oits., of the value of 16,081*l.*, the ley of 6*l.* 2 oits. per ton, equal to 7*l.* 7*s.* 6 oits. per ton, according to the old measurement. It is reported that all at the mine is going on well. The advices to hand show that the profit for December was 9908*l.* 2*s.* 7*d.* The stamping duty was good, the quantity of mineral treated being larger by 1040 tons. The assay value of the total tonnage gives an improvement of 1*l.* 2 oits., but owing to the higher estimate of wagonweight of ore taken there is an apparent decline of 688 oits. per ton. The explanation is that the wagons were estimated to contain 16 cwt., whilst, in fact, they contain 1 ton, hence 100 trucks contain 100 tons, instead of 80 tons as formerly estimated, consequently the gold contained in 125 truck loads has hitherto been credited to 100 tons of mineral. The managing director's note to the advices is, therefore, inaccurate, since 6*l.* 3 oits. new measurement is equal to 7*l.* 7*s.* 6 oits. old, and 6*l.* 2 oits. new = 7*l.* 5 oits. old. To make a correct comparison the trucks holding 1 ton instead of 16 cwt., one-fourth must be added to the new produce, or one-fifth subtracted from the old. Don Pedro North del Rey, $\frac{1}{2}$ to $\frac{3}{4}$; the produce for December was 4123 oits., of the value of 1752*l.* 5*s.* 6*d.* obtained from 2463 tons of ore. The cost (including 34*l.* on permanent pumping machinery) was 2756*l.* 1*s.* The cost was higher owing to increased rate of exchange, high price of provisions, and unusual quantity of timber and other material required.

Richmond, 8 to $8\frac{1}{2}$, ex div.; the usual telegram from the mine at Eureka states that the week's run was 880,000 from 1030 tons of ore. The week's produce of the refinery was 555,000. The mine is looking very well. The manager's report states that the winze below the 900 is in ground very favourable for sinking. In the 800 they are drifting towards the line, and on reaching it they will cross-cut to the quartzite and rise therein to the 700; the present end is looking very promising. They have also struck some very good ore below the Lizette tunnel, but do not yet know the extent. The ore they were smelting was of higher grade, and he expected better returns than the previous week. The furnaces are doing their usual quantity of work, and are still in very good working order.

By the latest advices the Emma Mine is doing well. The Bay City tunnel is being pushed ahead vigorously; 60 ft. more tunnel completed, and 60 ft. rise will communicate with the old workings of the Emma Mine. Flagstaff, $\frac{1}{2}$ to $\frac{3}{4}$; some amusing facts connected with the company's impecuniosity are furnished by the chairman in his letter in another column, in reply to the statement as to the injunction published in last week's *Mining Journal*. The shaft is now down 391 ft., and a drift has been started on the vein. Mr. Tracy still manages the development of the mine. Lead has advanced to 5 cents currency in New York, and market reported steady. At the Mineral Hill Mine about 40 miners, including chloriders, find constant employment.

Hultfall, $\frac{1}{2}$ to $\frac{3}{4}$; the timbering of the shaft was expected to be completed by Feb. 15, when sinking and driving will be resumed. From the latest accounts in the dressing department the agent expects to commence crushing and dressing at the end of the present month.

The market for Hydraulic and Gold Washing shares does not show any very material change; prices remain much as last reported. The quantity of rain which has fallen has enabled the miners in all parts of California to start washing, and everybody concerned is hopeful of a good season this time. The local news is of the most cheering character on this head. Blue Tent, 3 to $3\frac{1}{2}$; operations are steadily progressing since water commenced running through the ditch. Very good hopes are entertained of the results this year. A cable despatch during the week announces a partial clean up, the first of the season resulting in a return of 24400*l.* Cedar Creek, $\frac{1}{2}$

to $\frac{3}{4}$; the superintendent (Mr. J. A. Stone) reports that he has turned water on the Baker claim, and will be washing there steadily in the course of a few days, when the accumulated dirt has been cleared from the lead of the incline. A Nevada paper of Jan. 20 says—"The heaviest rain of the season fell in Nevada county yesterday. It came with a bluster that meant business, being preceded and accompanied with a south west wind, which gave things a general shaking up. Trees bent before the blast, casements rattled, and buildings trembled to their foundations, but they were sounds of melody to many an anxious mineowner who has stood idle all the winter by his claim waiting for water, which seemed as if it would never come. It was cheering to hear the congratulations exchanged on all sides, everyone appearing as happy as if he had struck a bonanza. It was a bright day in our weather calendar, and a hopeful one for the mining industry of this county, and doubtless of the whole mining region of the state."

Lead Mines have been somewhat firmer, in sympathy with the better price for lead, especially in America. Van, 28 to 30; the lode in the bottom of the shaft is strong and masterly, well mixed with blende and lead. No change in any part of the mine, and all work progressing as usual. Grogwinion, $\frac{1}{2}$ to $\frac{3}{4}$; good progress is being made at all points. Wye Valley, 2 to $2\frac{1}{2}$; the 48 ft. level is showing good lead. West Wye Valley— $\frac{1}{2}$ to $\frac{3}{4}$ —continues to look well throughout. Another parcel of lead will be sampled next week. Red Rock, 2 to $2\frac{1}{2}$; there is no change to note. A second parcel of ore will be sampled in a few days. Caron, 2*l.* 2*s.* 2*d.* St. Harmon, 2 to 3; good strings of ore are still met with in the bottom level.

Court Grange, 1 to $1\frac{1}{2}$; a great improvement has lately taken place in the bottom of the mine, the lode being worth 40*l.* per fm. Pateley Bridge, $\frac{1}{2}$ to $\frac{3}{4}$; the Rake vein, in the 30 east, is now 6 feet wide, worth 2 tons of lead ore per fathom. The ground is easy. The western end, on the same lode, and other parts of the mine, unaltered. The stopes and metal bargains are yielding good ore. West Pateley, 2 to $2\frac{1}{2}$; the agent writes that the new winding-engine is working splendidly, and that he has commenced drawing the orestuff broken in the 20, will resume driving both ends early next week, and prepare to sink for a 30 ft. level, "where there is every indication of meeting with a great deposit of ore, as the vein improves in value every fathom we get deeper." Good progress continues to be made in re-opening the Craven Cross shaft, and sinking will soon be resumed below the adit (56 fathom level) to get under the ore ground driven through for 20 fms. in length; 15 tons of clean ore ready for smelting.

Subjoined are the closing quotations:—
Asheton, 3*l.* to $1\frac{1}{2}$; Carn Brea, 30 to 41; Devon Great Consols, 3 to $3\frac{1}{2}$; Dolcoath, 30 to $3\frac{1}{2}$; East Caradon, $\frac{1}{2}$ to $\frac{3}{4}$; East Van, 2*l.* 2*s.* 2*d.*; Glenroy, $\frac{1}{2}$ to $\frac{3}{4}$; Great Laxey, 20 to 22; Hington Down Consols, $\frac{1}{2}$ to $\frac{3}{4}$; Leadhills, $\frac{1}{2}$ to $\frac{3}{4}$; Marke Valley, $\frac{1}{2}$ to $\frac{3}{4}$; Parys Mountain, $\frac{1}{2}$ to $\frac{3}{4}$; Penstruthal, 3-18 to 5-18; Roman Gravel, 7*l.* to 7*s.*; Rookhope, $\frac{1}{2}$ to $\frac{3}{4}$; Tankerville, $\frac{1}{2}$ to $\frac{3}{4}$; Thieroff, 11 to 12; Tyn-y-fon, $\frac{1}{2}$ to $\frac{3}{4}$; Van, 2*l.* 2*s.* 2*d.*; West Asheton, $\frac{1}{2}$ to $\frac{3}{4}$; West Chiverton, 12 to 14, ex div.; West Pateley, 2 to $2\frac{1}{2}$; West Tankerville, $\frac{1}{2}$ to $\frac{3}{4}$; Wheel Crebor, $\frac{1}{2}$ to 1; Wheel Grenville, $\frac{1}{2}$ to $\frac{3}{4}$; Almada and Tiritio, 3-16ths to 5-16ths; Birdseye, $\frac{1}{2}$ to $\frac{3}{4}$; Blue Tent, 3 to $3\frac{1}{2}$; Cape Copper, 3*l.* 2*s.* 2*d.*; Cedar Creek, $\frac{1}{2}$ to $\frac{3}{4}$; Chontales, 9-16 to 11-16; Colorado Terrible, $\frac{1}{2}$ to $\frac{3}{4}$; Don Pedro, $\frac{1}{2}$ to $\frac{3}{4}$; Eberhardt and Aurora, 6*l.* to 6*s.*; Emma, $\frac{1}{2}$ to $\frac{3}{4}$; Exchequer, $\frac{1}{2}$ to $\frac{3}{4}$; Flagstaff, $\frac{1}{2}$ to $\frac{3}{4}$; Frontino and Bolivia, $\frac{1}{2}$ to $\frac{3}{4}$; Hultfall, $\frac{1}{2}$ to $\frac{3}{4}$; I.X.L., $\frac{1}{2}$ to $\frac{3}{4}$; Javali, $\frac{1}{2}$ to $\frac{3}{4}$; Kapanga, $\frac{1}{2}$ to 1; Last Chance, $\frac{1}{2}$ to 1; New Quebrada, 2 to $2\frac{1}{2}$; Oregon Preference, 4 to $4\frac{1}{2}$; Piesarena, $\frac{1}{2}$ to $\frac{3}{4}$; Plumas Eureka, 2*l.* 2*s.* 2*d.*; Port Phillip, $\frac{1}{2}$ to $\frac{3}{4}$, ex div.; Richmond Consolidated, 8 to 8*l.*, ex div.; St. John del Rey, 320 to 330; Sierra Butte, $\frac{1}{2}$ to $\frac{3}{4}$; South Aurora, 3-16ths to 5-16ths; Tecoma, $\frac{1}{2}$ to $\frac{3}{4}$; United Mexican, 2 to $2\frac{1}{2}$.

COLLIERIES.—The market for colliery shares is not more lively than others, prices ruling in most cases about the same as last week. There has, however, been a little increased enquiry for some few colliery shares, notably those of Chapel House, owing presumably to the report of the completion of the new pit to the Park Mine. The coal trade throughout the country is, as it has been for some time past, quiet, but it is getting steadier, particularly in some districts, amongst which may be mentioned Yorkshire and North Staffordshire. Trade in South Wales is still dull, except in some of the hematite fields. The shipments for last January from the South Wales ports show, however, an increase over those of January, 1877, the figures being 170,620 tons and 138,109 tons at the respective dates. The long Northumberland strike has, as everyone but the striking miners themselves must have foreseen, at last ended in the submission of the men; not, however, until their Union is completely broken up, and the trade of the district gone into other hands, particularly into those of South Wales.

The Barneley coal basin, won at Houghton Main Colliery at a depth of 515 yards. The quality of the coal is excellent, and it appears probable that this will prove one of the finest collieries in its district. The Chapel House Company is now drawing coal from the Park Mine, and expects shortly to be getting some 300 tons per day from this seam. This, added to its output from other pits, will make a considerable increase in the company's profits, and there can be no doubt that the company will soon prove itself to be, as everyone who knows the colliery has predicted, one of the most successful of all our colliery companies. The shares are firm at 3 to $3\frac{1}{2}$, and show signs of rising. The coal in the various districts at Alham is reported as looking well. These shares close at 4 to 5. A good trade is being done at Day Hall, the shares of which are at 3 to 10. Other prices are: Cakemore, $\frac{1}{2}$ to $\frac{3}{4}$; Cardiff and Swansea, 1 to $1\frac{1}{2}$; New Sharlston, $\frac{1}{2}$ to $\frac{3}{4}$; Newport Abercrom, 4 to $4\frac{1}{2}$; Thorp's Gawber, $\frac{1}{2}$ to $\frac{3}{4}$; Consett, $\frac{1}{2}$ to $\frac{3}{4}$; John Abbott and Co., 6*l.* to 6*s.*

WEST PATELEY (Lead).—The report this week refers to the satisfactory working of the Robey's winding-engine. The manager says that since Feb. 4 it has continued to draw ore stuff 12 hours per day, and that it will take another week to clear the levels of ore. Approaching the perpendicular of the old shallow workings the indications lead to the opinion that other deposits of ore are in the immediate locality.

BODIDRI.—It is reported that the 45 yard level is turning out some extraordinarily good ore (lead and blende), and as this is in the easternmost workings it may be looked upon as a valuable discovery. All points are being pushed on with vigour, and the mine will, doubtless, prove a great success.

ST. PATRICK.—The recent discovery of lead in the bottom level maintains itself. An extra force of men has been put on at this point (120 north), in order to reach at the earliest possible moment the rich east and west lode which is supposed to be in connection with the ore discovered in the cross-course. Should this supposition be proved correct a great prize is in store for the company.

BAMFFYLDE.—We understand a new company is to be formed under the title of "The North Molton Mining Company (Limited)" for the purpose of taking over the Bamffylde Mine. The shareholders last Thursday confirmed resolutions to wind-up voluntarily; all holders of shares will have the option of taking an equivalent number of 1*l.* shares in the new company, 15*s.* paid, and to hand in any debentures they may hold in payment of the remaining 6*s.* A considerable number of shareholders have already joined, and it is expected the bulk will follow. The latest report from the mine speaks favourably of copper prospects, and there are immense quantities of iron ore ready to be sent off the moment the trade revives. It is to be hoped that now that the management will be entirely new and vigorously carried on, the shareholders will not lose the opportunity to be afforded them of joining the new undertaking, and sharing in the prosperity which we believe is destined to be in store for the company.

NEW TINCROFT.—Uny Lelant has been celebrated since the reign of Alfred for its yield of tin, and for the last 500 years has maintained a prominent position in its products of that metal. Several of its more prominent mines have, however, had to succumb to the heavy depreciation in price of that metal, consequent on the discoveries in Australia, coupled with the stagnation of trade and commerce during the past four or five years. Still, in the face of these difficulties, mining has progressed, and we are pleased to record that at New Tincroft the prospects of late have greatly improved. The monthly sales are likely permanently to augment, and, should the present prospects become realised, a short time will probably force this mine into prominent notice.

MINING IN CARDIGANSHIRE.—It is satisfactory to find, amidst the general gloom which pervades all our home industries, that there is increasing life and activity arising in the lead mines of Cardiganshire. This county, long known in connection with the adjoining county of Montgomery for its rich deposits of silver-lead ore, has for some time past been suffering from the general depression, and many deserving mines have been obliged to stop for want of capital. It is, however, a good sign of the *bona fides* of the mines of Cardiganshire to see local people investing their money in them, and such is the case. Rich discoveries have also been made, all tending to strengthen public confidence. We notice this week that a company has been formed for the purpose of working the well-known mines of Blaen Caelan, immediately to the west of the Cambrian Mines. These mines, which were highly productive some years back, were stopped, mainly owing to the embarrassments of Mr. J. B. Balcombe; for some time past they have been worked by local parties, and have now been formed into a company, all the shares of which have been taken up by the proprietors. Upon clearing the mine and continuing the sinking, which is, after all, the true test of the productiveness of a mine, a very rich course of ore has been laid open, sufficient, it is stated on a moderate estimate, to produce 40 tons of ore per month. There is ample power, plant of machinery, &c., to turn out this amount, with the alternative of

using steam, should it be necessary owing to either frost or drought. Other mines are also developing satisfactorily, and although the present price of pig-lead is low—exceptionally so—there is every appearance of a revival of lead mining industry in Cardigan, where, with moderate capital, with judicious management and selection, there can hardly fail to be a handsome return for capital.

GENERAL MINING COMPANY OF IRELAND.—The liquidators (by telegram received this afternoon) request us to announce that the auction of the mining plant advertised for the 20th inst. will not take place, a private offer for it having been accepted.

* With this week's Journal a SUPPLEMENTAL SHEET is given, which contains:—Original Correspondence: Tasmanian Tin Fields, No. VI. (J. Mafford); Mine Management—the Soylla and Charybdis on which many English and Foreign Companies are Stranded; New Quebrada Mining Company; Richmond Mining Company; Mining in the East—No. XXVII.; An Oaken Colliery Shovel (W. H. Merritt); Electric Illumination; Rock Boring Machinery (J. Barkell); Treatment and Separation of Ores; New Tylwyd Mining Company (D. Forrest); (Public Companies in the Future (M. F. Dormer); The Formation of Companies (H. Lambert); Metalliferous Mining in North Wales; the Llanrwst Lead Mine (R. Knapp); Ystumtean Lead Mine (G. Green); Mining in Cardiganshire (T. Rosewarne); Cardiganshire—Abandoned Mines (A. Williams); Llanmoult Lead Mine; Hington Down Consols—Account House Expenses (R. Symons); Promotion Mines; Dale End, Warslow (E. S. Darwin); West Godolphin Mine.—The Interests of British Capitalists and Investors, and the Policy to be Pursued (J. B. Reynolds); The Almada and Tiritio Mines—Patent Matters—Meetings of Mwyndy Iron Ores, Last Chance, Parys Mountain, and Morfa-du Mining Companies.

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Notices to Correspondents.

* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

SMYTH'S LECTURES.—Any subscriber having duplicates of either of the last seven numbers of the Mining Journal for 1875, containing the reports of the earlier lectures of Prof. Smyth's course at the Royal School of Mines, will oblige by returning one of them, for which full price and postage will be returned.

SMALL ELECTRO MOTORS.—Can any correspondent inform me through the Journal the best and most economic battery to employ to drive a small electro motor of about 1-16th horse power, also the cheapest form of electro motor of the power mentioned at present in the market? I have been looking at a battery and motor of the most modern construction, but am told that the price is 10*l.* 10*s.*, which is much too high for a machine intended for popular use. If a 2*l.* 2*s.* machine could be devised it would, I should think, have a large sale.—WAZNER.

THE WORKING OF COAL.—We shall next week publish a description of the Parallel Multiple Wedge Expander, &c.

NICKEL PLATING.—Some years since a process for coating iron hinges, bolts, and such like with nickel was proposed, I believe, by Mr. W. T. Henley, the telegraph engineer, or at all events it was in his works that the experiments were tried. The articles treated were very elegant, and were claimed to possess the advantage of being much less liable to rust. Are hinges of the description mentioned now obtainable, and where? I should also like to know the price as compared with uncoated hinges.—M. S.

Received.—"H. S." (Utah, Jan. 18)—"Shareholder" (Hington Consols): The letter could only appear with the writer's name appended—"Constant Reader" (Edinburgh) should apply to a patent agent—"M. E." (Bristol): We should be glad to have the particulars—"Shareholder" (Gravesend): The office is at 23, Great St. Helen's—"M. P. J."—"Investigator" (Great Holway)—"L. O. H.": It would have been an advertisement as written, and should have been paid for as such—"Miner" (Leek)—"F. C. B." (Wimbledon): Next week—"Shareholder" (Wheat Grenville)—"A. T." (the Working of Tube Wells): Next week.

THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, FEBRUARY 16, 1878.

EXPORTS OF RAILWAY IRON.

Nothing can more effectually show the great changes that have taken place in the coal and iron trades of the country than a review of the rise and fall in the price of our railway iron, and the fluctuations in the production during the past 10 years, as shown by our exports. They show with great distinctness what an important bearing the price of coal has on the cost of iron, and how much one is governed by the other. In those years when coal was very low iron was at a moderate price, but as the former commenced rising in value so did the other in a corresponding degree, until in 1873 both reached a point previously unknown, and not likely to occur again, at least during the present generation, for the opening out of so many collieries when prices of coal were so very high, and capitalists were madly investing in them, has caused the productive power of our coal mines to be almost double what it was even 20 years ago. In 1868 it appears that railway iron was slightly higher in price than it now is, and for some years afterwards it advanced, until the climax was reached in 1873, when coal also reached the highest point ever known. In the following year the decline set in both in iron and coal, and continued to do so up to the close of the year 1877, when railway iron was lower than it has been since 1867. Our heaviest exports, however, were in 1870, when coal was plentiful and cheap, and were more than double those of last year. When we compare those two periods we need not feel at all surprised at the present stagnation which prevails in the iron trade, or the number of men who are unemployed. During the last 10 years the consumption of rails and railway accessories abroad has been immense, for we alone have shipped close upon 6,500,000 tons, of the value of upwards of 72,000,000*l.*, so that it cannot be expected that anything like the same quantity is likely to be required again, seeing that a large proportion of our exports during the busiest years were for lines being constructed, so that the maintenance of the permanent way is all that has now to be done. Russia, however, is likely to be still a good customer to us, for in that vast country there is still much to be done in opening out communication with the interior; but so much cannot be said with respect to other continental countries, who have for some years past been purchasing extensively from us. Our own colonies, however, will doubtless be amongst the best customers we have in future. The remarks we have made will be fully borne out by the following figures, showing the exports of railway iron during the last 10 years and the price as well:—

Year.	Tons.	Value.	Per ton.
1868	583,488	£ 4,660,612	£ 7 19 9
1869	888,010	7,238,170	8 3 0
1870	1,059,392	8,756,52	8 5 3
1871	981,197	8,084,619	8 5 0
1872	945,430	10,225,493	10 18 3
1873	755,014	10,415,483	13 5 5
1874	752,457	9,629,400	12 8 3
1875	685,987	5,453,838	10 0 0
1876	414,656	3,700,105	8 2 6
1877	497,924	3,884,916	7 15 3

The price per ton is given without taking into consideration fractions.

RAILWAYS AND IRON.

The fluctuations in price which steel and iron have experienced during the last ten years have been most remarkable. Thus when the manufacture of Bessemer steel rails was commenced in Pennsylvania in 1867 or 1868 the price of steel rails of American manufacture was about \$168 per ton currency, while that of English made steel rails was about \$160 per ton gold. It was not very long before the market price of British rails declined to \$80 per ton, and now after ten years' experience the American article is produced and sold for about \$40 per ton, or less than half the price of iron rails when the American manufacture of Bessemer steel was commenced. In other words, a steel-made railway does not now cost half so much as an iron-made railway cost ten years since; while, moreover, steel-made railways have ten times the wear in them.

The great cheapness of iron at the present remarkable epoch in the history of the iron manufacture is leading to the extended adoption of a complete system of iron permanent way. Upon the Belgian State Railways, for instance, a series of elaborate trials has taken place with a view to the discontinuance of wooden sleepers, and the substitution of iron in every department of permanent way maintenance. There can, we fancy, be little doubt that if wooden sleepers could be dispensed with great economy in permanent way maintenance would be the result. At present sleepers are always going to the bad. A too ardent sun one day and heavy rain on the next try the endurance of a wooden sleeper very severely, and anyone who takes a trip over 100 miles of one of our great railways may soon satisfy himself as to this, as he will not fail to see numbers of rotten sleepers lying about in various localities. Moreover, the item of maintenance of way in railway companies' accounts is always a more or less formidable one. Thus if we take the accounts of the London, Chatham, and Dover Railway, for example, we find that while the gross working expenses of that system in the second half of 1877 were 300,335*l.*, out of that sum 47,578*l.* went in maintenance of way and works. On the London and South Western Railway while the working expenses in the second half of 1877 were 692,072*l.*, out of that sum 135,017*l.* was absorbed in the maintenance of way and works. On the Manchester, Sheffield, and Lincolnshire Railway, again, out of 447,188*l.* expended in working expenses in the past six months 60,334*l.* was absorbed in the maintenance of way and works. We might, of course, extend the analysis much further, but enough has already been said to show, what is indeed notorious, that permanent way maintenance is a formidable item in railway expenditure, and that anything which can reduce it must be a great boon to ordinary stockholders in railways. The substitution of steel for iron is already a great point gained. Is it too much to say that the adoption of an iron permanent way will result in further important economies?

We observe that the cheapness of iron in the United States is

further leading to the employment of iron freight cars, instead of wooden trucks, upon some of the American systems. At any rate, the Chicago, Burlington, and Quincy Railroad Company has now in use some 20 box cars of the La Mothe pattern. These cars are made of boiler tubing and steel rods. The sills are of 24-in. tubing; the top framing of soft steel rods, united without joint, mortice, or screw, forming an unsurpassed combination of strength and lightness. The box cars are covered with sheet-iron, united by lap and groove, and they are padded inside with a light felting of paper. The interior is lined with thin light wood. The purpose of the paper and wood lining is to preserve an even temperature within the car; and it is claimed that these cars are thus rendered cooler in summer and warmer in winter than the ordinary box car. The weight of the metallic box cars, with the trucks upon which they are placed, ranges from 17,000 to 18,000 lbs. each, while the ordinary wooden cars on the Chicago, Burlington, and Quincy Railroad average 20,050 lbs. each. In addition to the saving which they effect in dead weight, metallic freight cars have also a greater carrying capacity.

THE DEPRESSION OF TRADE.

An important conference, organised by the Bristol and District Working Men's Reform Association, was held at the Guildhall, Bristol, on Tuesday. The attendance was large and influential, various trade societies being represented, and many delegates from different parts of the kingdom being present. In opening the proceedings the President (Rev. Dr. Percival, of Clifton College) said that it was now a time, whether as regarded trade or politics, when they should do all they could to throw aside passion and prejudice, and to look facts in the face seriously and earnestly. They were met there that night to consider the causes of the prevalent depression or stagnation in the trade of our country. They were there to listen to the opinions of the employers and employed, and they would be thus able to hear the result of personal experience supplemented by careful thought. He was constantly of opinion that something was required to be done to keep the class of employers and the class of workmen from separating themselves off into two antagonistic camps. Working men on the one side were tempted to complain in times of prosperity or possible inflation when employers were growing rich very rapidly that the working men were very slow to get any share of those additional profits. On the other hand the employers complained of many rules of the trade societies, that there were bye laws which were not strictly for the public good, that the men were not allowed to work piece-work, that men struck and working men, instead of submitting to a slight reduction in wages, preferred to stand out for higher wages, and refused to work full time; and that the tendency of the trade societies' rules was to reduce the active energetic man down to the level of the mediocre workman, and to create among workmen as a class a kind of malingering habit over their work, thus checking the energies of their own class, and thereby doing mischief not only to their class but to the nation at large. Whatever dangers there were in store for us there could be none so great as that the large army of employed should look upon the capitalists as anything but their fellow labourers and friends. Amongst numerous letters then read by Mr. T. M. Kelly was one from the Rev. John Griffiths, rector of Merthyr, who attributed the depression in all industries to the way in which the price of coal was run up in 1872 and following years. He remarked that 1*l.* per ton was once regarded as a profitable price, and that to run it up to 30*s.* was a self-evident absurdity, inviting rivals into the field. In 1871 he paid in Merthyr 25*s.* per ton for coal, and he can now get it for 10*s.*

An elaborate address on the causes of the depression was then read by Mr. HANDEL COSSHAM. He maintained that in this country land plays but a secondary part in the support of our population, and that the present land laws injuriously curtail the number who can live by the cultivation of the soil. He remarked that the expenditure of national wealth in war and costly armaments is also at the root of many of the commercial depressions of our country and the world. He regarded our drinking habits and our national drunkenness as one of the greatest causes of the depression of trade. He considers class legislation has been one of the great curses of the past, and one of the great obstacles to commercial prosperity; the true interest of every class can only be reached by seeking to promote the interest of all. During the last 30 years the trade of the country has greatly changed. Before the repeal of the Corn Laws our trade was mainly confined to the supply of our own wants, but since the adoption of free trade our foreign trade has so greatly increased in proportion to our home trade, that we are more subject to panic and sudden depressions in trade. He considered that anything that brings about war or ill feeling, as between employers and employed, helps to break down public confidence, and to bring about trade depression. If we are to prosper as a nation there must be hearty co-operation between capital and labour in the advancement of the national welfare. Mr. Cosham defends trade unionism, and contends that while the right of combination should be carefully guarded by law, and be protected by the enlightened judgment of public opinion, the right to abstain from combination should be equally and religiously guarded. He urged that erroneous views were being propagated as to over production being the cause of depression. Speaking generally and broadly he would assert that the higher the wages that can be paid to any industry the better, but that increased wages must result from an increased demand for labour and the increased value of the article on which labour is being bestowed, or it will result in loss and ruin to all concerned. In conclusion, he pointed to a few of what he considered political, religious, and social defects, national and international, and suggested that our trade may have its ebbs and flows; it is ebb tide to-day, but it will flow again to-morrow.

The land law views exhibited in the paper were concurred with by Mr. A. Macdonald, M.P., but he contended that the drunken habits were no less with workmen than with the land and upper classes. He warmly defended the trades union principle of fixing a minimum wage, and pointed out that this did not hinder the employer from giving as much extra as he liked to the expert workman. He contended that it was the accumulation of money in the hands of the few that tended to the present stagnation and distress. He could not see that the interests of capital and labour were mutual. Mr. Hunt then read the report of the delegates who had gone to South Wales to enquire into the condition of miners. It showed that there was a great falling off in trade, and a very critical state of affairs. Mr. Abraham (Swansea) moved "That in the opinion of this conference the establishment of a just and comprehensive system of conciliation for the settlement of disputes between employers and employed would tend to the benefit of both classes, and of the nation at large." The resolution was carried unanimously.

THE EMPLOYERS' LIABILITY FOR INJURY BILL.—In noticing in last week's Journal the Employers' Liability for Injury Bill, we stated that the Bill was rejected last year by a large majority. Now, as the Bill was not introduced during the session of 1877, but in that of 1876, it will be seen that there was a mistake, but one that in no way interfered with the remarks we made respecting it. Admitting, as we frankly do, that an error crept in as to the year, we have to express our thanks to Mr. Alex. Macdonald, M.P., for having drawn our attention to it in a letter addressed to us from the Westminster Palace Hotel, Feb. 11.

THE MINING ASSOCIATION OF GREAT BRITAIN.—At the annual meeting of this association, held on Wednesday, at the Westminster Palace Hotel, Mr. Thomas Knowles, M.P., was unanimously elected President for the ensuing year.

MINERS' NATIONAL UNION.—Arrangements are being made for holding a special conference of the representatives of the miners of England, Scotland, and Wales, at Birmingham, in the ensuing month of March. All classes of miners, whether connected with the National Union or not, are invited to send delegates to take part in the deliberations of the conference. The business announced for consideration is to see if anything can be done to lessen the evils at present arising from an over-production, and consequent plethora, of coal in the market. It is expected that Mr. Macdonald, M.P., will preside.

THE BARROW HEMATITE IRON AND STEEL COMPANY have commenced making spigite iron at their works at Barrow-in-Furness. They are using large cargoes of Carthagen ore and a small proportion of Moleore. Hitherto spigite iron was shipped from Germany. It is largely used in the steel trade owing to the high percentage of manganese it contains. The spigite iron already made at Barrow is of a highly satisfactory character.

ACADEMIC HONOUR.—At a congregation of the Senatus Academicus of St. Andrews University, on Monday, the honorary degree of LL.D. was conferred on HENRY WOODWARD, F.R.S., F.G.S., of the British Museum. The honour will be regarded as well merited by all who have had an opportunity of observing his earnest labours in the cause of science.

SAFETY FUSES.—Some further improvements have been invented by Mr. W. BICKFORD-SMITH, of Tuckingmill, consisting in the preparation and use of a cotton or other yarn or similar material impregnated by coating, saturation, or otherwise, with some suitable combustible or explosive substance or mixture, the material so prepared being used in the place of the core of gunpowder now commonly employed in fuses for conveying ignition to the charge to be exploded.

TRAMWAYS.—The Board of Trade has issued a Return which shows that from the passing of the Tramways Act in 1870 to the end of June last year, Parliament sanctioned the raising for tramway purposes of capital amounting in the aggregate to 5,528,950*l.*, of which

3,269,744*l.* has already been raised and expended. The total length of tramways authorised was 363 miles, of which 213 had been opened to the public at the date of the return. Most of the tramways have been made by private enterprise, and only one of the companies is in liquidation.

REPORT FROM CORNWALL.

Feb. 14.—There is really very little more to say than we said last week. If we have not yet precisely wars, of rumours of wars there certainly have been an abundance, and the markets have sympathised with the fluctuations in the aspect of foreign affairs until they have appeared to be overdone by excitement, and faded enough to take even the most alarming intelligence with tolerable quietude. What hope is there while such a state of things continues that there can be any improvement in the particulars on which the prosperity of all mining, and not merely of our own special form of that industry, now depends? And still all we can say is "Wait." Perhaps some little revival may come of the unwonted activity into which the 6,000,000*l.* vote has stimulated the Government dockyards and arsenals. With such stocks as are now in hand, however, the hope of relief from this quarter, except of the most infinitesimal character, must be very small indeed.

It is, perhaps, rather singular that at such a time as this we should hear of the likelihood of some old sets "down west" being re-worked. That there is as fair a chance of success in some of the abandoned copper mines, as events have proved there was in Melanear, we regard as absolutely certain, but whoever takes them in hand will have to go carefully to work. A not unimportant augury of the success which may attend the re-opening of tin mining in neglected districts is supplied by the very satisfactory results which have so far attended the working of Great Wheal Eleanor and North Bovey, where one of the old tin districts has been taken up and re-worked with such prospects that even at present prices a dividend by-and-bye is not considered at all an improbable contingency. There is plenty of evidence abroad if one only takes the trouble to look for it that not only is our mining a long way off from being dead but that a great deal of the old spirit still exists, though for awhile content to work quietly along.

At South Crofty account the other day an application from the Cornwall Mining Institute asking the adventures to give some pecuniary aid to enable the Institute to publish its proceedings more extensively for the benefit of mining was ordered to lie on the table for six months. There is nothing to be surprised at in this. In these bad times it is not likely that mines will care to lay out any money that does not seem to be an absolutely essential item of expenditure. But it was all the same when times were good. The assistance which the Royal Cornwall Polytechnic Society and the Miners Association have received from the various mines has been, save in a very few instances, absolutely insignificant, and the Mining Institute is thus only sharing the common fate. But this ought not to be. Of late years there have been very few improvements in mining which have not been pioneered directly or indirectly by one of these societies, and gratitude should prompt some recognition. However, we do not anticipate any change in this direction at any rate at present. The Mining Institute need not be discouraged. It will be able to do good work like the other societies, notwithstanding, if not precisely all that the members may wish to do.

Some comments have been made of late again on the low rate of wages which some tributers have been earning. But they are most unreasonable. Better for a man to work even on low speculative tributing terms than not to work at all, and it is of no use to blame the managers of mines for their lending such aid as they can to men out of work in the only way, too often, that these hard times have rendered possible.

Some valuable remarks were made the other day by Mr. W. L. Martin, of Lee Moor and St. Au-tell, upon the position of the china-clay trade. No one is better able to form an opinion on this point. In the whole course of his life, he said, he had never known such a large amount of business done for so small a profit. Mining was in a fearfully depressed condition, and there was a doubt whether the bottom of the apparently bottomless abyss had yet been seen. The china clay trade also was in a very bad state. It would no doubt have been bad enough if left to those who were in it previously, but people seemed to think that they had only to take a claywork and their fortunes were made. They listened to interested parties in the district, promising 30 per cent., and purchased the works; and the result was that instead of these promises being fulfilled he was afraid they had lost pretty well all their capital. It had been asked over and over again what was the cause of this depression. He thought that question could be answered in one word, "over-production." If there was only a small amount of production over the power of the consumer sooner or later a collapse must come.

The man who exploded the dynamite at Capt. Goldsworthy's has not yet been discovered. The reward of 25*l.* offered by the secretary of Treleigh Wood (Mr. T. B. Laws) has been supplemented by a reward of 50*l.*, offered by Mr. Cornish, on behalf of the West Penwith magistrates, for such evidence as will lead to the conviction of the perpetrator of the outrage. The offer applies to any accomplice giving the necessary evidence, provided he be not an actual participant in the crime.

Though not strictly a mining matter, we may refer here to the appearance of the second volume of the "Bibliotheca Cornubiensis," edited by Messrs. G. C. Boase and Mr. W. P. Courtney. The work contains, in just a thousand pages, a list of all books and articles relating to Cornwall, and matters Cornubian, of all Cornish authors and all workers of eminence in science, literature, or the arts connected with the county. The labour entailed in the production of this book has necessarily been enormous, but the result was most valuable. For example, if anyone is interested in working up a mining subject, engineering, mineralogical, metallurgical, or what not, here are references to all that has been written on the subject. By-and-bye a third volume will appear, with a complete index.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Feb. 14.—I mentioned in last week's report that the colliers from Flintshire were migrating to Lancashire, where there is more work and better wages for them. I am glad to see that, following their example, a movement is on foot for taking 1000 colliers from South Wales to the same district. Most of the men have been discharged from the Presgwyn Colliery, near Chirk, so that the Quinta Colliery is about the only one at work at the present time in North Shropshire. Most of the little collieries worked in the top coal measures of South Shropshire have also ceased working. The importation of coal from other districts into the county is very great. The lead mines of South Shropshire are obtaining their coal from the Denbighshire and Staffordshire collieries more cheaply than from those close to them.

A fine morning, and the interest attaching to the experiment, led a good many visitors to the Roman Gravel's Lead Mine on Friday last, to witness the trial of the Eclipse Rock Drill, manufactured by Hathorn and Co., Charing Cross, London. One of these drills has been in use at the mine for some time past in the underground workings. The trial on Friday was made in a hard quartzose rock, toughened by an admixture of calcareous matter that comes to the surface near the south shaft of the mine on Shelve Hill. With 40 lbs. pressure the machine struck 400 blows a minute; it bored, first, a hole 1½ in. diameter 5½ in. in a minute and half; second, 5½ in. in half a minute; and, third, 6 inches in two minutes. The difficulty the drill had to encounter with was the looseness of the uppermost layers of the rock, the motion of the drill shifting them somewhat out of their place, and causing them to bind against the revolving bit. When this had been obviated the drill bored its full length at the average rates above. Capt. Cotes and Mitchell from Snailbeach Mine were present, and selected some of the spots for the operation of the drill, and the whole of the "mining men" present expressed themselves satisfied with the experiments. The air-compressor is beautifully made, and appears to do its work well. The weight of the drilling machine without the tripod is 120 lbs. The opinion was pretty generally expressed that the desideratum in drills driven by com-

pressed air was a small handy one for use in the confined working spaces of hard stopes. Messrs. Stokes and Parnell, who conducted the experiments, said they made such a drill. It is not my purpose here to compare the working of this drill with that of others. At present I am an historian, not a critic.

Time was too brief for anything but a very cursory look at the machinery in use at the Roman Gravel Mine, but enough was seen to show that some excellent machinery was doing its work well. I noticed especially the 13 self-acting jiggers, and a bundle with a rotatory intercepting motion, and the whole arrangement showed what intelligence can do towards the profitable extraction of metals from not the richest kinds of ore. West Tankerville was working towards success. The locomotive of Snailbeach was busy climbing along its railway. Tankerville was busy, but it was not pleasant to think of other mines—Pennerley, Batholes, Perkins Beach, and others standing idle. One great want of the district seems to be a tramway that shall thread its way through the mines, for with a cheapening of cost of extraction and of carriage, and a freedom from burthens of unnecessary capital, there should be more paying mines in this region.

Care should be taken by mine and quarry proprietors to secure representation for themselves on the county boards now to be formed. Otherwise, if that representation is confined to agriculturalists they may find themselves unduly saddled with turnpike-gates, extra rates, and the like.

I mentioned lately that four miles of road in Salop was said to cost 5000l. per mile for repairs since it had been used by traction-engines. A writer in a local paper points out that this sum is equal to a coating of stone 6 in. thick and 15 ft. wide, and as the road in question has not received anything like such a dressing as this, he properly asks what has been done with the money?

In Cardigan mine prospects are improving, and it is hoped that this year will see an important addition to the number of paying mines in that county.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 14.—On the whole, the demand at the collieries is a slight increase upon a week and fortnight ago. The blowing-in of the three blast-furnaces announced last week means an increased consumption of furnace coal of about 600 tons a week, and the re-lighting of a furnace at Wednesbury Oak by Messrs. Philip Williams and Sons also involves an additional consumption of about 150 tons. As a set-off, however, against this must be mentioned the blowing-out of the furnace at Walsall of the Castle Coal and Iron Company, and the contemplated stoppage of production by the Osier Bed Iron Company. The demand for forge coal is larger by some 150 tons upon the week, consequent upon the starting of some forges at the Swan Garden Ironworks in Wolverhampton, now owned by Mr. John Lysaght. The House Coal Trade remains steady, and prices are firm. In the Pig-Iron Trade high-class iron is in increased demand, but inferior sorts are very dull. The finished ironworks where sheets for galvanising are turned out are doing well, and Government dockyard requirements are giving a fillip to one or two producers of first-class iron. There are indications that an attempt will shortly be made to get the tin-plate workers of the Midlands to accept lower wages, in order to enable the makers of tin-plates hereabouts to quote lower prices, so as to compete successfully with the Welsh makers.

The secretary and the law clerks of the Mines Drainage Commissioners have now presented their report of their investigation of the memorial of the owners and occupiers of mines in the Bilston district for exemption from underground drainage. The result of their investigation is that the memorial has been signed by a majority in rateable value of occupiers, but not by a majority in rateable value of owners. No definite opinion is expressed as to the validity or otherwise of the petition, and the point is a debatable one.

The arbitrators have made a draft Mines Drainage award for the Tipton district. Petitions against the Commissioners' new bill have been presented by the Oldbury and the Bilston districts, and by Earl Dudley.

Differences that have for some time past existed between the miners of South Staffordshire and the National Union, with which they have been affiliated, have at length culminated in the secession of the West Bromwich district and the suspension of the Darlaston (or South Staffordshire district proper). The practice of the National Union not to order a compulsory levy in the case of a large strike, but to leave the strikers mainly dependent for support upon voluntary levies, and the belief of the South Staffordshire men that their brethren in the North are not much interested in them, are the main causes of the rupture. It seems probable that the Darlaston district will altogether separate itself from the parent Union at no distant date.

The colliers' strike at Longton, North Staffordshire, is now virtually at an end, the men having resolved to go in at the 10 per cent. drop. The struggle has lasted some 18 weeks, and has been a loss to the community of some 35,000l.

At Burslem William Robson, underground manager, and Isaac Boulton, underlooker, at Messrs. R. Heath and Sons, Norton Colliery, were charged with neglecting to see that a certain working had been propped. The Mines Regulation Act requires "sprags" or props to be placed at intervals of 6 ft. in travelling roads and working places, and in this instance a dip of 15 ft. was left wholly unsupported. The consequence was a fall of roof and the death of the man working there. The full penalty of 40s. and costs was inflicted upon each of the defendants. Mr. Wynne, Government Inspector of Mines, said half the colliery accidents of the country were caused by falls of roof, and the great majority of these might be prevented by due attention to propping.

TRADE OF THE TYNE AND WEAR.

Feb. 14.—There is little new to report in connection with the Coal and Coke Trades here. The excitement caused by the cessation of hostilities in the East and the opening of the Black Sea has died out very quickly owing to the fear of more serious complications. In North Durham the collieries are pretty well employed, gas coal being the most important product of those works, and some steam coal has also been shipped. This coal in Durham has to some extent taken the place of the Northumberland steam coal. Some very hard steam coal is produced at the collieries of Earl Durham and Earl Vane on the Wear, and this has been shipped lately at 11s. per ton. The demand for house and gas coal continues fair, but for ordinary manufacturing coal and coke the supply is still far above the demand, and consequently the collieries in South Durham are only moderately employed. The cause of this state of trade in South Durham is mainly due to depression in the iron trade and the continued reduction in the make of pig-iron, and also finished iron of all kinds, with the exception, perhaps, of ship plates.

The unfortunate strike in Northumberland may now be considered to be at an end, the main body of the men having accepted the terms of the masters, and at some of the important works at Bebside, Delaval, &c., work will be resumed this day (Thursday), the reduction on former rates being 12½ per cent. There are some dissentients to this course, but the bulk of the men are thoroughly convinced that no other course is open to them, and they are also convinced that the course they have pursued has only had the effect of injuring all parties concerned; many of the men, indeed, objected to striking at the commencement, but the ignominy attached to any men who act for themselves of course deterred those men from any independent action. In any case a strike is to be regretted, but in the present condition of trade and the labour market in the district it might have been foreseen both by the men and their leaders that absolute starvation must be the result, and so it has proved. Numbers of families even in the county of Durham, where work is comparatively regular, are in a starving condition, and in the county of Northumberland matters are of course most deplorable. It appears that an appeal has been made to the Queen for aid in one particular case, rather a novel proceeding where strikes are concerned. One miner's family were in most deplorable destitution, and were put to extraordinary straits; a happy idea was hit upon, however, a note was sent to the Queen detailing their special case, and soli-

citing a subscription. A note was received in reply requesting that the circumstances be confirmed by a minister in the district, which was done, and in due time the minister had the satisfaction of receiving a Post Office order for 2l. The incident has created a pleasant sensation in the neighbourhood, and the kindest of the Queen is much commented on.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Feb. 14.—The Iron Trade exhibits no new phases this week, and business is as dull as it well can be, but looking at shipments of our staple productions it will be noticed that they have been larger last month than in the corresponding month of 1877. As affairs now stand in the East there is an obvious inclination on the part of would-be purchasers to hold back until the result is known. The demand for both iron and steel rails is quiet, and in bars there is but little doing. During the week the main clearances of iron have been to India and Alexandria. Indeed, India has of late, been our best customer; a large proportion of last month's clearances were in this direction. The Tin-Plate Trade has not materially changed. There is a little more activity in the Coal Trade, and some of the pits, among them those of the Powell Duffryn Company, are better employed. There is reason to believe that some of the Government steam coal contracts have been secured for this district, and if prices could but advance a little the look-out would be much more cheerful. The demand for steam coal is fairly active, but business in house qualities is not brisk, nor is patent fuel. The colliers in the employ of the South Wales Colliery Company, at Abertillery, have struck, to the number of several hundreds, owing to the attempted enforcement of a reduction in wages. There seems no hope at present of a settlement. A great deal of distress continues to prevail.

During the month of February last Cardiff shipped 4969 tons of iron, compared with 3822 tons in the same month of 1877; Newport, 9187 tons, against 2968 tons; and Swansea, 1090 tons, against 226 tons. The principal clearances were to—Bombay, 6777 tons of rail, and 913 tons of bar; Hammelvigen, 755 tons rail; Rio Janeiro, 600 tons of rail; Syria, 560 tons of bar; Pillau, 1530 tons, and Valencia, 925 tons of rail. Coal shipments (foreign) last month were—Cardiff, 311,003 tons, compared with 283,579 tons; Newport, 53,417 tons, compared with 46,949 tons; Swansea, 69,166 tons, compared with 43,502 tons; and Llanelly, 6510 tons, compared with 3925 tons. Coastwise clearances in the same period were—Cardiff, 79,563 tons, against 59,959 tons; Newport, 68,877 tons, against 62,170 tons; Swansea, 22,189 tons, against 15,980 tons; and Llanelly, 7962 tons, against 6221 tons. Patent fuel clearances were—Cardiff, 8327 tons, against 5402 tons; and Swansea, 9526, against 8618 tons.

Notwithstanding the depression in trade the railway companies appear to have come out of it very well. The Taff Vale Railway—largely dependent as it is on mineral traffic—pays the usual dividend of 10 per cent. per annum for the last half-year, and a bonus of 1 per cent. per annum. The Bristol and South Wagon Company, another flourishing concern, pays a dividend at the rate of 10 per cent. per annum, and a bonus of 2 per cent. per annum for the last half year. The directors, in consequence of increased business, have thought it desirable to allot 3000 shares at 30s. per share premium *pro rata* among the shareholders. The Penarth Harbour, Dock, and Railway dividend is to be at the rate of 4½ per cent. per annum for the last half-year.

The Mwyndy Iron Ore Company meeting has been held—Mr. Alexander Brodgen, M.P., in the chair. There was no dividend announced, which is a fact not to be surprised at when the bad times are taken into consideration. A further call of 5s. per share is to be made. The Chairman congratulated the shareholders on the fact that throughout a year of unexampled depression the company had contrived to make a profit of 7800l.

The death of Mr. George Brown, manager of Messrs. Nixon's collieries at Mountain Ash and Ynysowen, is announced. He had been for 20 years in the responsible position of sole manager of these extensive collieries. His death will be felt as a serious loss, not only to his employers but to his many friends.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 14.—Business still continues dull and depressed throughout that portion of Derbyshire in which are some of the largest ironworks and collieries, and a large number of workmen are but partially employed, and others entirely idle, so that at some places it has been found necessary to call the soup kitchen once more into requisition. The rolling-mills and the puddling-furnaces have been very quiet, although there has been no falling off in the production of the blast-furnaces. In other branches no change appears to have taken place, so that some of the foundries are getting along steadily. At Dronfield, midway between Sheffield and Chesterfield, which has of late years grown into a place of some importance, there is considerable activity at the extensive Bessemer establishment of Messrs. Wilson and Cammell, who are now turning out large quantities of rails, and it is said have orders in hand that will last for some months. Messrs. Lucas, so well known for their light malleable castings, spades, and shovels, have also been doing tolerably well. At Clay Cross, Blackwell, Eckington, and some other well-known centres there has been a fair demand for house coal, and a full average tonnage has been sent over the Midland to the Metropolis. The trade, however, has not been by any means equal to the tonnage that could be raised, for short time is still the rule. Several new collieries are also being sunk, and the Messrs. Wells have sunk another one on the Midland Railway, a short distance from Killamash. The low price at which coal has to be sold is causing the wages question to again crop up, seeing that colliery-owners in very many instances are not making any profit whatever, and are not desirous of disturbing the relations at present existing between them and their workmen, yet they feel they cannot go on much longer as at present.

At the Renishaw Park Collieries the men were recently asked to submit to a reduction of 5 per cent., when a number of them strongly opposed it. The district agent, however, told the men that they should act with great caution in the present state of trade. A deputation having waited upon the managing director he agreed to let the matter stand over until March. The Miners' Association of Derbyshire and Nottinghamshire through the directors has been beating up for recruits, who can enter for a mere trifle, so that it is the fault of the miners if they do not become members. It is said, however, that they show no disposition to join any association, believing that they are as well off as they are, if not better, as is the case of the Staveley miners.

In Sheffield affairs remain in much the same state as when last reported, there being still a large body of men without work, and in a very bad state. A large fund has been raised, and the liberality of the townspeople is in the highest degree creditable to them, for supplies of almost every description, including clothing, are being daily received at the depôts. Recently some orders for heavy armour-plates have been cleared out, principally for the Austrian iron-clad *Tegethoff*, and well as for our own land batteries. A great deal of attention is now being paid to the construction of plates of great resisting power, and there is every probability that a much larger number of persons is now engaged in experiments on them than has been the case before, of such great importance is the subject. Plates of 24 in. thickness can be penetrated, and to have them much thicker the buoyancy of the vessel and its sailing power would be affected, hence the necessity for having plates of less depth with a greater resisting power. Bessemer rail makers have been doing very well, and the production is well maintained, not only at the works in the town but those outside as well. In crucible steel for cutlery, rods, axles, wheels, and other purposes the business doing is still but moderate. A few of the leading cutlery houses have been doing tolerably well in the best qualities of table knives, but inferior sorts are not much required for. The demand for files is still quiet, and the men on Friday last agreed to accept a reduction of wages all round. Some of the foundries are favourably off for business, whilst the plate and sheet mills are also looking rather better. House coal throughout the South Yorkshire dis-

trict has been in seasonable request, but owing to the many new collieries opened out during the last year or two the trade has been greatly divided, whilst in consequence of the coal being so plentiful it has come down in price to a point that leaves merely a fringe of profit to the owner.

In one or two instances of late the men have made small concessions to the employers, but such it is expected will have to be more general before long. From the Silkstone and some other collieries there has been a very fair business done with the Metropolis by the Great Northern Railway during the past month. There has, however, been very little change with respect to steam coal, smudge, slack, or coke. Mr. F. Wright, the head partner in the Batterley Company's works and collieries, the largest concern in Derbyshire, has announced his intention of being a candidate at the next general election for East Derbyshire. A few days since a collier, named Smith, residing at Chesterfield, was fined 20s. and costs for having matches in his possession in the Foxley Oaks Colliery.

JORDAN'S PATENT HAND-POWER ROCK-DRILL.

Public trials of this rock-drill have been held in different parts of the country within the last few weeks. On Thursday last a large party of gentlemen connected with the mining and quarrying interest in the district of Warwickshire attended to witness an exhaustive trial of the machine at the quarries of the Midland Quarrying Company, at Nuneaton. The granite met with in this district is some of the hardest in the country, and was, therefore, well fitted to test the powers of this drill, which, in boring a series of holes in various parts of the quarry, maintained an average rate of drilling of 2 in. per minute, the holes being from 1 to 2 in. in diameter, and from 1 ft. to 2 ft. 6 in. in depth. Great satisfaction was expressed by all present with the working of the machine, the position of which was frequently changed during the trial, thereby showing its great portability and the facility with which it can be fixed in any place.

The result of this trial shows that great saving will be effected by the adoption of this compact tool in the place of ordinary hand-drilling, the rate of which in these quarries does not exceed 12 to 15 in. per hour, and we shall be much surprised if it is not very soon in general use in the kingdom.

IMPROVEMENTS IN NAILS.

Some valuable improvements in the manufacture of nails and similar articles, such as spikes, pins, and so on, have recently been patented through Mr. E. de Pass, patent agent, of Fleet-street, by Messrs. BIANCHI and FABRIS, of Sherborne-lane, one of the essential features being the employment of either rolled metal or wire or rods of triangular section instead of the round or square sections now used in forming the shank of the nail. The rose-head and chisel, pointed with a triangular shank made according to this invention is very neat, and is admirably adapted for cutting its way, or entering the material into which it is driven, and for more securely holding together the materials to be joined. By the use of the triangular sectional wire the cost of the nail is considerably reduced, and at the same time a more serviceable, effectual, and cheap article is the result.

In order still further to increase the bight of the nail the inventors sometimes form grooves, channels, or furrows in any or all of the sides of the shank; it is not, however, necessary that the grooves in the shank should always be continuous and extend to the point of the nail, as when formed at intervals or for a portion only of the length of each side of the triangle the result is excellent. As the nail penetrates the material into which it is driven the sharp or pointed sides of the triangular shank and the sharp edges formed by the grooves tend not only to cut their way into the material, but also to hold well and tightly together the materials when connected. The invention is, of course, capable of many modifications, but those mentioned are quite efficient. By the employment of triangular sectional wire or rods the nails are well adapted for quick and strong work, and stiffness for driving as well as toughness for turning or clenching, and by notching or ribbing them a greater holding power is obtained than in other nails, besides which they are easier and safer to work. The notching may also be advantageously applied to nails of square, round, or other section.

CLEANING TIN AND TERNE PLATES.

A novel system of removing by means of special machinery the oil and grease, whether hot or cold, from tin and terne plates after the process of coating or tinning has been invented by Mr. JAMES JENKINS, of Cardiff. He employs one or more vertically disposed revolving barrels placed inside a surrounding casing, such casing being filled with bran, "sharps," sawdust, or other suitable cleansing material of light character. The surfaces of the barrels may be smooth, but he prefers to make them grooved, fluted, or with hollows, teeth, or projections disposed either spirally at any convenient angle to the axis of the barrel, or parallel to the said axis, or both combined, as found most convenient in practice. The barrels are caused to rotate by the aid of gearing or otherwise, and by the act of rotation in the bran, sharps, or other cleansing material, they take up a portion of such bran or cleansing material, which, by adhering to the teeth or hollows on the surface of the barrel or barrels, forms a substantial jacket, tyre, or covering thereto, which covering of bran, sharps, or the like, serves as a most effectual cleansing medium. The angle of the flutings, hollows, or teeth tends to maintain a constant change of the bran or other cleansing material in the surrounding casing upon the surface of the plate to be cleaned. The barrels when used in pairs may be adjusted towards or from each other by adjusting screw spindles and nuts, or other equivalent mechanical contrivance, acting upon the bearings of the said barrels. In front of the barrels there may be provided, if desired, a pair of feed rollers, which are driven at a slower rate than the cleaning barrels, or if the barrels revolve in a contrary direction to the feed rollers, then the difference in speed is not material. The feed rollers may, if preferred, be dispensed with, the plates being simply fed through the machine by hand between guides, it being simply necessary that the surfaces of such plates shall be brought in contact with the bran-coated surfaces of the cleaning barrels. The cleaned plates, which may or may not be dusted by sheep-skin rollers or other suitable dusters, issue in a perfectly clean condition from the opposite side of the machine ready for sorting and packing. A portion of the bran or sharps falls through one or more openings in the bottom of the casing, and is again elevated and fed into the top of the said casing, thus maintaining a constant change in the mass of bran, whilst still ensuring the casing being always full.

With regard to details Mr. Jenkins explains that in the best form of apparatus he uses a metal or other casing provided with a narrow vertical slit on opposite sides thereof, and corresponding with the line of junction or contact between the two vertically disposed cleaning barrels. The spindles of these barrels work in top and bottom bearings, which are made adjustable towards or from each other by screw spindles, each having a right and left-hand screw thread made thereon, and working in travelling nuts forming part of or screwed to the bearings. There are driving pulleys for imparting a rotary motion in any desired direction to the barrels, and a strap and pulleys for turning two adjusting screw spindles by hand. In order that the barrels may be more effectually take up the bran or sharps, and become completely coated thereby, so as, in fact, to present a jacket or surface of the said cleansing material, he prefers to make their surfaces grooved, or fluted, or with hollows or projections, the said grooves or flutings having the rear side flat, or shaped after the manner of ratchet teeth. Some of these flutings may be made spiral, and he prefers that they should each make about one turn in the length of the barrel, whilst others are made straight or parallel to the axis of the barrels from end to end thereof, and crossing the spiral grooves. He also, if found requisite, employs guides in front of the slits for guiding in the plates to be cleaned, and he sometimes uses a pair of feed rollers driven by a positive motion for feeding the plates through the machine. He also pro-

poses to combine with the said machine an ordinary elevator of any well-known construction, for the purpose of taking up the bran or sharps as it discharges itself from the lower part of the casing through a spout, and returning the same to the top of the casing through a suitable aperture. By this means he ensures a continual change or renewal of the coating of bran or sharps on the cleaning barrels, and hence the plates are more expeditiously and perfectly cleaned. The chief advantages claimed to be obtained by the use of this invention are economy in labour and material, also greater expedition in the work, and a more thorough and perfect cleansing of the plates.

FOREIGN MINING AND METALLURGY.

Official returns which have just been compiled show that the imports of pig and iron into France in 1877 exceeded the corresponding imports in 1876 by 14 per cent. The imports of steel into France experienced, however, some decline last year. The increase in the imports occurred wholly in the imports with payment of duty. The exports of iron and pig in 1877 from France showed a reduction of 17 per cent, as compared with 1876. The exports of steel presented, however, some increase last year. The exports of iron minerals from France in 1877 declined to the extent of 26,000 tons, or more than 24 per cent, as compared with 1876. The imports of iron minerals into France increased last year to the extent of 120,000 tons, or more than 14 per cent; the greater part of the minerals imported came from Belgium, Spain, and Algeria. The quantity of iron introduced into Paris last year showed an increase to November 30 of 31,000 tons as compared with the corresponding period of 1876; the imports of pig and cast-iron also increased 79,000 tons. The building works prosecuted in connection with the Exhibition were the principal cause of the increase. In the Haute-Marne the iron trade has been quiet; the political uncertainties of the moment checking business. Charcoal-made pig has ranged according to quality from 44. 4s. to 44. 13s. per ton. Rolled iron has made from 64. 12s. to 94. per ton, and sheets from 74. 4s. to 94. per ton. At Paris the iron trade is considered to have slightly improved. In the Loire and Rhone districts there has been nothing to report.

The imports of minerals and limailles into Belgium last year amounted to 783,000 tons, as compared with 671,000 tons in 1876, and 604,000 tons in 1875. The imports of rough pig and old iron into Belgium in 1877 were 193,000 tons, against 207,000 tons in 1876, and 147,000 tons in 1875. Nearly one-third of these quantities came from England. The imports of wire, rails, plates, nails, &c., into Belgium presented little variation last year. The exports of minerals and limailles from Belgium in 1877 were 216,000 tons, against 166,000 tons in 1876, and 142,000 tons in 1875. France was the principal client of Belgium under this head. There were few changes last year in the exports of rough pig and old iron from Belgium. Rails, wire, nails, &c., were exported to the extent of 100,000 tons last year, against 91,000 tons in 1876, and 81,000 tons in 1875. The Belgian iron trade is still characterised by a persistent stagnation. A meeting of industrialists connected with the three coal basins of the Hainaut has been held to promote an enlargement of the canal from Charleroi to Brussels, and the construction of a canal from Mons to Charleroi, passing via the centre district.

In the French coal trade business has generally ruled quiet. The administration of the Creusot Works is endeavouring to effect a reduction of wages, which the workmen have refused to accept. German colliery proprietors are competing with French industrialists, so that not only is the production of coal checked in France, but all hope of securing higher prices has to be abandoned. Details have just been published by the St. Etienne Mineral Industry Society of a fire-damp meter, invented by M. Coquillière, at Montceau-les-Mines and Blanzay. The Belgian coal trade cannot be said to have improved, as there has been only a relatively small revival in the Belgian iron trade, and the winter is nearly over. The situation is the same at Liège, at Charleroi, and in the Centre; prices continue to show extreme weakness. The value of the imports of coal into Belgium declined last year to the extent of 107,240t., as compared with 1876. The value of the exports also fell off 253,480t. last year.

A letter from Lima, in the Cologne Gazette, refers to the discovery of coal at Chala Alta, near Ouzco, in the department of Libertad. The bed is described as of unknown extent. The Government has sent a scientific commission to examine the deposits, and has received a highly favourable report. The Chala Alta coal field will, it is said, suffice to supply the requirements of the whole of South America, and the quality and cheapness of the coal will enable it to drive the English coal from these markets. The average consumption of coal on the coast of Peru is estimated at 200,000 tons per annum, which, at the rate of 22 soles per ton, gives a total of 4,400,000 soles at present paid to England for fuel, and which Peru hopes to save by utilising her newly-discovered sources of coal supply.

The following figures show the production of pig-iron in Prussia during the past four years:—In 1877, 28,420,632 cwt.; in 1876, 26,486,773 cwt.; in 1875, 27,966,730 cwt.; in 1874, 25,605,370 cwt.

PREVENTING HONEYCOMBS IN CASTINGS.

The annoyance and inconvenience caused by blow-holes or honeycombing in castings made from molten wrought-iron, steel, or other metals, are well known; and with a view to prevent them, and thus ensure soundness in the casting, an invention has been patented by Mr. JOHN BOURNE, C.E., of Mark-lane, according to which he extracts from the metal while in the molten state the gas or gases by which the honeycombing is produced. The removal of the gases may be effected by the aid of any mechanical means capable of producing rarefaction, such as a common pump, an exhausting jet of steam or other fluid, the hydrostatic gravitation of a column of the molten metal itself, or any other exhausting expedient, by which a vacuum more or less perfect is produced. The molten metal must be exposed to the action of the vacuum in such a manner as to ensure the disengagement of the gas from the metal, and for this purpose he submits the metal to the vacuum preferably in a state of minute subdivision. This may be accomplished by allowing the molten metal to run through perforations in a fire-clay block into a tall cylinder, within which a vacuum is maintained. By thus subdividing the metal, and discharging it in the form of a metallic rain into an exhaust chamber, the gases are separated from the metal, and are sucked away by the pump or other extractor in communication with the exhaust chamber. He remarks that it is not intended to subdivide the molten metal (without the aid of a vacuum) for the removal of the gases, nor to attempt to suck away the gases from a vessel filled with molten metal by producing a vacuum above the metal, as the hydrostatic pressure of the metal itself would under such circumstances retain the gases within the metal, notwithstanding the existence of the vacuum above it; but he extracts the gases by the conjoint action of the vacuum and of the subdivision, as above explained, or by analogous or equivalent means embodying the same conditions.

As a modification of this process he sometimes melts the metal in a crucible provided with a horizontal division plate, having one or more holes therein, through which holes the metal as it melts flows drop by drop into the bottom part of the crucible. He also makes the crucible with a top or cover, which is luted on, and he conducts a pipe from this cover or other convenient part of the crucible to a pump or extractor, by which a vacuum is maintained within the crucible itself. Each successive thin layer of metal as it melts is thus exposed to the action of the vacuum, whereby the gases are sucked away in much the same manner as when the molten metal is poured through a perforated block, as above described. In either case the gas-retaining influence of a column of liquid metal, which produces a hydrostatic pressure within the body of metal itself, is neutralised.

The mould for the reception of the molten metal may, it is obvious, be placed within the vessel in which the vacuum is maintained when that course is convenient, or the metal may be merely cleared of its gases within the exhausted vessel or chamber, and may be conducted thence while still fluid into moulds exposed to the atmo-

sphere in the usual manner. Should the metal be cooled too much in the operation of pumping out the gases to retain the necessary fluidity for casting, it may be re-heated previous to casting either in vacuo or in the atmosphere by the aid of a suitable crucible. As water in the act of freezing expels the air with which it was charged, and as this air, if rapidly expelled, makes the ice opaque, by reason of the minute air bubbles entangled in its substance, so metals in the act of solidifying tend to expel their gases, and as their solidification is necessarily rapid, a portion of the gases is imprisoned, and honeycombing is naturally produced. He aids the operation of expulsion of the gases during the cooling of the molten metal, for as the metal cools the gases, besides being expelled, will be pumped away, and cannot, therefore, be re-absorbed.

EXPLOSIONS IN COAL MINES.—A short course of lectures on this subject has been delivered at the Society of Arts by Mr. T. Wills, F.G.S. In the last two lectures reference was made to some considerations connected with safety-lamps, the effect of barometric and thermometric alterations, and the part played by coal dust in explosions. As regards safety-lamps, it has long been known that a strong blast of wind will carry the flame through the gauze and ignite inflammable gas outside the lamp; but it appears only to have been recently made out that a very slight concussion, or even a puff of air, if sufficiently sharp, will have the same effect. This was shown on Monday by firing a mixture of air and gas surrounding a lighted safety-lamp placed at the end of a long tube by the concussion produced by a pistol shot at the other end, a flexible diaphragm being fixed across the tube to prove that the effect resulted merely from a concussion of air. It was remarked on this that the firing of a shot in a mine might readily drive the flame of a lamp at some distance through the gauze, and so ignite the surrounding fire-damp, all the lamps being afterwards found uninjured, without anything to show how the accident had been caused. With regard to the photometric value of different lamps, the lecturer stated that some interesting results had been arrived at. With all the English lamps in which glass is used it is found that the mere addition of the glass chimney or cover diminishes the light by about a third, but with the Mueseler or Belgian lamp the arrangements are so contrived that the addition of the chimney increases the combustion in a corresponding degree, and so there is no loss of light at all. On the point of meteorological changes Mr. Wills remarked that many great explosions, such as those last autumn at Blantyre and Wigan, could be distinctly traced to falls of the barometer, not immediately before, but some day or two before, and he urged that it was not sufficient to consider only changes in the few hours preceding the catastrophe, as had been generally done in such investigations. The effect of a mixture of fine coal dust was shown by a striking experiment, in which a perfectly non-inflammable mixture of air with a small proportion of gas fired immediately when a little fine coal dust was shaken up in the bottle containing it. As in many dry mines this dust exists in large quantities, it was evident that it might often be the cause of otherwise inexplicable explosions.

Meetings of Public Companies.

CLEMENTINA MINING COMPANY.

The first ordinary general meeting of shareholders was held at the offices of the company, on Friday (yesterday), Mr. J. Y. WATSON, F.G.S., in the chair.

The directors' report, together with the accounts and agent's report, were received and adopted. It was also resolved—"That the secretary call a meeting at once, in order to carry out the proposition of the directors in regard to the raising of fresh capital."

The CHAIRMAN said he hoped not more than 5s. per share, which would give 640t., would be required, as he thought there would be regular returns of lead now the winze had been communicated with the bottom level.

Capt. ROBERTS thought there would be no difficulty, if the lode continued as at present, in getting 10 tons of lead ore per month. The CHAIRMAN also referred to the fact that the great Gorse lode of D'Eresby passed through the seat, and could be cut by driving on an east and west lode from the adit. This east and west lode might pay for the driving with its produce, but as the cross-cut would have to be extended about 70 fathoms he thought it would be best to sink as far as they could upon the lode from the surface, as it had in other mines made rich very shallow.

Capt. ROBERTS also suggested this plan, and after a conversation, in which Mr. Hitchens and others concurred, the plan was decided upon.

NORTH LAXEY MINING COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Austinfriars, yesterday, Mr. G. W. BLOGG in the chair.

Mr. J. H. MURCHISON (London manager and secretary) read the notice calling the meeting.

Mr. DAUKES said the meeting was convened for a special purpose, to which the business of the day must be confined. The shareholders would recollect that at the last meeting there was a report given by Mr. Plummer, who was a special agent of Messrs. Taylor's, and that report recommended a certain course of proceeding at the mine, which would require an outlay of 2300t. The object of this meeting was to hear what the directors had to say in connection with the raising of the same. He could only say that the directors had taken the subject into full consideration, but were very much disappointed to find that by the Memorandum of Association it was impossible to increase the capital of the company, unless by altering the Memorandum, which would take three months to do; and even if the Memorandum were altered the money could only be raised by the issue of an additional number of ordinary shares at par. The directors intended to suggest that a resolution should be passed authorising the directors to borrow, in accordance with clause 72 of the Articles of Association, a sum not exceeding 2500t. Of course, it was very easy to borrow if they had good and ample securities to borrow upon, but in this case they had had the plant valued, and the valuation did not exceed 11 0t.—that is, if the things were sold and taken away. The proposition, therefore, to borrow would probably have doubtful results; and unless the shareholders came forward with some scheme of advancing the money, perhaps the best way would be to adopt a plan of which Mr. Murchison had given the details, which were contained in a letter from Mr. George Maley, who suggested the reconstruction of the company.

Mr. MURCHISON read the letter referred to, in which Mr. Maley suggested the formation of a new company, with a capital of 25,000t., 5000t. to be given to the present company, and 15,000t. to be given as bonus shares to those who subscribed the 5000t.

Mr. LEWIS read two or three letters on matters of detail, and said that what was wanted was good local management.

The CHAIRMAN, in answer to a question, said that Mr. Jardine had resigned his position as Chairman of the company in consequence of pressure of other occupations, but was ready to assist in any project for the advancement of the interests of the company.

Mr. LEWIS said he knew the ground well, and they would get the ore in depth. The CHAIRMAN said he thought they might place every confidence in the report of Capt. Plummer, which gave them hope of getting into a better position. The feeling in the room was strongly in favour of fresh management. He might mention that there was a second resolution to be proposed to the effect that in case the money could not be raised by loan, the directors should have power to reconstruct the company.

Mr. LEWIS was in favour of the suggestion of Mr. Maley for the reconstruction of the company, in which case there was a probability of the matter being carried out, but he believed they would never get the money in the mode proposed under the first resolution.

Mr. DAUKES said there seemed to be a strong feeling on the island that if the management were altered, and the company reconstructed, persons would come forward and subscribe towards the capital.

A SHAREHOLDER thought that the reconstruction scheme should be passed. Some further discussion ensued, and it was proposed that as there did not seem much probability of raising the money under the first resolution, that resolution should be put and formally negatived.

The CHAIRMAN accordingly formally moved that the directors be authorised to borrow, in accordance with Clause 72 of the Articles, a sum not exceeding 2,500t. Mr. W. L. NASH seconded the resolution, which was put and lost.

It was then decided that the second resolution should be passed in the form of a suggestion to the board, and accordingly, on the motion of the CHAIRMAN, seconded by Mr. LEWIS, the following resolution was passed:—"That the directors are requested to propose a plan for the reconstruction of the company, and lay the same before the shareholders."

The meeting then broke up.

PONTGIBAUD SILVER-LEAD MINING AND SMELTING COMPANY.—An extraordinary general meeting of shareholders was held in Paris on Feb. 2, when the report of the commission appointed at the extra-

ordinary general meeting in December last, to verify certain matters connected with the property and accounts, was submitted; and, it being found satisfactory in every respect, the necessary formal resolutions were passed for the purpose of transforming the company into a Société Anonyme, according to the law of July 24, 1867, and of approving the new "statuts" (Articles of Association).

DENBIGHSHIRE CONSOLIDATED.—At the extraordinary meeting held yesterday (Friday), Mr. F. Rendall in the chair, the resolution for increasing the capital of the company was confirmed. A very interesting report was made by the secretary, Mr. E. J. Bartlett, as to the present position of the mine. We shall publish a full report in next week's Journal.

[For remainder of Meetings, see to-day's Supplement.]

ALMADA AND TIRITO MINES.—With the exception of the paragraphs relative to the drought, which still continued in Sonora up to Dec. 28, the reports received from the mines to that date, inserted in to-day's Journal, are highly satisfactory. The Mina Grande was turning out sufficient black ore for the lixiviation process, whilst the Providencia and Tirito were giving good green ores for the "patio." The most important news, however, is that relative to the new discovery of docile ore south of the south side in Tirito, which has been already reported in the Journal as having been received by telegram. Mr. Breach sums up his views on this discovery as follows:—"As far as I can judge the lode is not thrown by the dislocation, and I fully expect the fine course of ore found to the north will repeat itself to the south of this so-called slide, where all is virgin ground, and it may be looked upon as a new mine, with a shaft already down 54 fathoms below adit, and the backs solid to surface."

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— ditto	23	11 5 6	ditto	
— ditto	2	11 0 6	ditto	
— ditto	2	11 0 6	Panther Lead Company.	
— ditto	2	11 0 6	Sheldon, Bush, and Co.	
12—Monydd Gerdud	10	13 10 0	Nevill, Druee, and Co.	
11—Talargoch	90	12 7 6	Walker, Parker, and Co.	
— Macysredda	30	11 5 0	Sheldon, Bush, and Co.	
— Coetia Llys	100	11 14 6	Adam Eytton.	
— North Hendre	100	11 12 6	Walker, Parker, & Co.	
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— Rhyd Alan	12	11 2 6	Walker, Parker, & Co.	
— Prince Patrick	10	10 13 6	Adam Eytton.	
— Grosvenor	5	11 1 6	Walker, Parker, & Co.	

		BLENDE.			
Date.	Mines.	Tons.	Price per ton.	Purchasers.	
Feb. 8—Minera	68	£4 0 0	Kenrick and Son.	
— ditto	10	4 5 0	Villiers Spelter Co.	
— ditto	10	4 5 0	Swansea Vale Co.	
— ditto	27	3 12 0	ditto	
— ditto	28	3 7 6	Villiers Spelter Co.	
— ditto	50	3 10 0	Swansea Vale Co.	
12—Talargoch	50	3 10 0	Villiers Spelter Co.	
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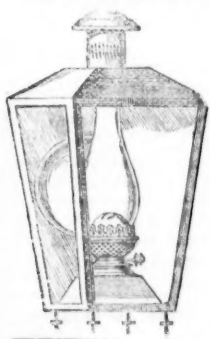
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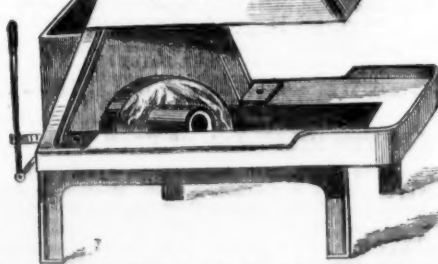
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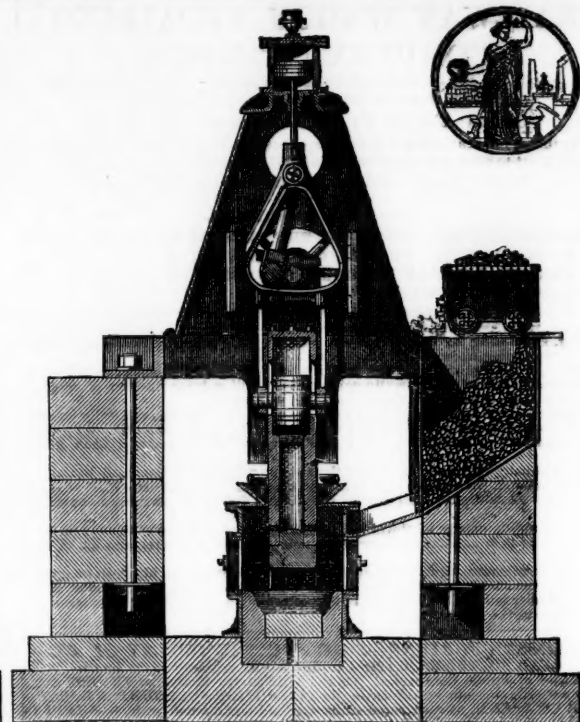
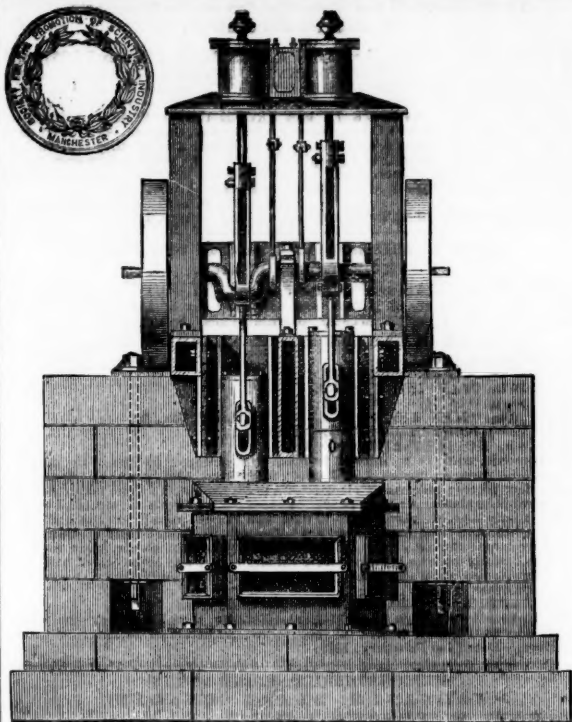
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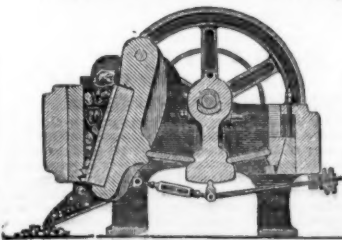
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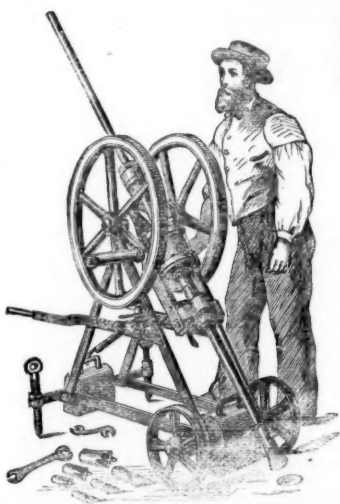
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